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BAKALÁŘSKÁ PRÁCE

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Sociophonetic study of substitutional glottalization in native English speakers

Sociofonetická studie substituční glotalizace u rodilých mluvčích angličtiny

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Declaration of Authorship

I declare that the following BA thesis is my own work for which I used only the sources and literature mentioned, and that this thesis has not been used in the course of other university studies or in order to acquire the same or another type of diploma.

Prohlašuji, že jsem bakalářskou práci vypracovala samostatně, že jsem řádně citovala všechny použité prameny a literaturu a že práce nebyla využita v rámci jiného vysokoškolského studia či k získání jiného nebo stejného titulu.

V Praze, 15. 8. 2016 .....

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Abstract

The glottal stop, previously labelled as a heavily stigmatized feature of British English pronunciation, has become widely spread across all social classes and the majority of British dialects. Young females are believed to be instrumental in leading the spread and causing the social re-evaluation of the feature. The aim of the present study is to analyze the occurrence of T-glottaling in the speech of British English speakers in relation to sociolinguistic factors, primarily age, gender and speaking style. The theoretical part provides a description of the linguistic and social aspects of T-glottaling. Particular attention is paid to the role of social factors in the process of language change. In addition, a brief overview of previous research is presented. The material for the empirical part of this study consists of 32 recordings of British English speakers. The analysis of the results reveals that gender, age and speaking style play a significant role in the frequency of occurrence of the glottal stop. Young females are shown to be the leaders of the spread of T-glottaling, which leads to the assumption that the language change is still in progress.

Key words: British English, substitutional glottalization, sociophonetics, language change

Abstrakt

Glotální ráz, výslovnostní prvek, který býval v britské angličtině zatížen silným sociálním stigmatem, je nyní hojně užíván mluvčími napříč všemi společenskými vrstvami a tvoří součást většiny britských dialektů. Vůdčí role v šíření této formy se připisuje ženám, a je to právě asociace s ženskou mluvou, která ji povyšuje na sociálně prestižnější. Cílem této bakalářské práce je prozkoumat výskyt substituční glotalizace u rodilých mluvčích angličtiny, zejména v závislosti na vybraných sociolingvistických faktorech: pohlaví, věk a typ projevu. V teoretické rovině nabízí práce popis lingvistických a sociálních aspektů T-glotalizace. Zvláštní důraz je kladen na chování sociálních vlivů během jazykových změn. Prezentován je také přehled dosavadního výzkumu v této oblasti. Empirická část práce je založena na analýze 32 nahrávek rodilých mluvčích angličtiny. Výsledky studie potvrzují, že pohlaví, věk i typ projevu mají značný vliv na výskyt glotalizace. Skutečnost, že ženy z našeho vzorku iniciují její šíření, může naznačovat, že glotální ráz stále prochází jazykovou změnu.

Klíčová slova: britská angličtina, substituční glotalizace, sociofonetika, jazyková změna

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1. Introduction

T-glottaling, the subject of the present thesis, is a sound change causing the phoneme /t/ in word-medial or word-final environment to be realized as a glottal stop [ʔ]. In English, the usage of a glottal stop is optional and its distribution is constrained by more that linguistic factors, as it was believed in earlier studies. T-glottaling involves a strong social aspect. Age and gender are considered the most influential social factors.

This type of glottalization has been a salient feature of the Cockney dialect. As such, it was typically associated with male working-class speakers and carried a heavy social stigma. However, during the last 20 years, the glottal stop has spread into all social classes and many speaking styles across Britain. As Wells (2008) points out in his blog post, the regular presence of glottalized /t/ has been registered even in the speech of Prince Henry of Wales. The spread is believed to be initiated by young people and particularly female speakers, which is understood as an indication that the language change in which the glottal stop is participating is still in progress. Furthermore, it is the influence of women's speech which is seen as crucial in bringing about the social re-evaluation of the glottal stop.

The theoretical part of the present study will first focus on the phenomenon of glottalization. A basic classification of the individual manifestations of the glottal stop is provided. The following chapter will provide an overview of the functions which glottalization can perform in various world languages, with particular focus on its allophonic function, specifically substitutional glottalization. The subsequent sections will be concerned with the linguistic and social aspects of T-glottaling. Particular attention will be paid to the role of social factors in the process of language change. Apart from that, an overview, summing up the findings of previous studies on the topic, will be provided.

The empirical part will be based on the analysis of 32 recordings of British English speakers. The primary concern regarding the data analysis is to examine the occurrence of T-glottaling in relation to the following social influences: gender, age and speaking style. The secondary concern is with the effect of linguistic factors, namely the prosodic position, segmental context and semantic category of the target word. Finally, the results, will be supported by statistical tests, and their possible implications will be discussed in some detail.

2. Theoretical background

2.1 Glottalization

Before we focus on the phenomenon of glottalization in detail, let us specify its position among phonation types.

Modal and non modal phonation

The term *phonation* can also be explained as the vibration of vocal folds. Based on the way how the vocal folds vibrate, there is a basic two point distinction between modal and non-modal phonation. ”Modal phonation simply refers to the “normal” or regular vibration of the vocal folds. Vocal fold vibration is a process which is happening in “cycles” (Skarnitzl, 2011, p. 31). The individual stages of the cycle are illustrated in Figure 1 below. From two different viewpoints, a. front view and b. view from above, we can see how the vocal folds gradually change their position from closed to open. During the closed phase, the air flowing out of the lungs is blocked by the closed vocal folds, which causes subglottal pressure to build up increasingly. Eventually, the pressure forces the vocal folds to open and the trapped air can flow out of the vocal tract. As soon as the air pressure is reduced, the vocal folds close again and the cycle can start anew. “It is the periodic interruption, constriction and blockage of this airflow which results in the more or less continuous flow of sounds which we identify as a sequence of speech sounds” (Yallop & Fletcher, 1995, p. 11).

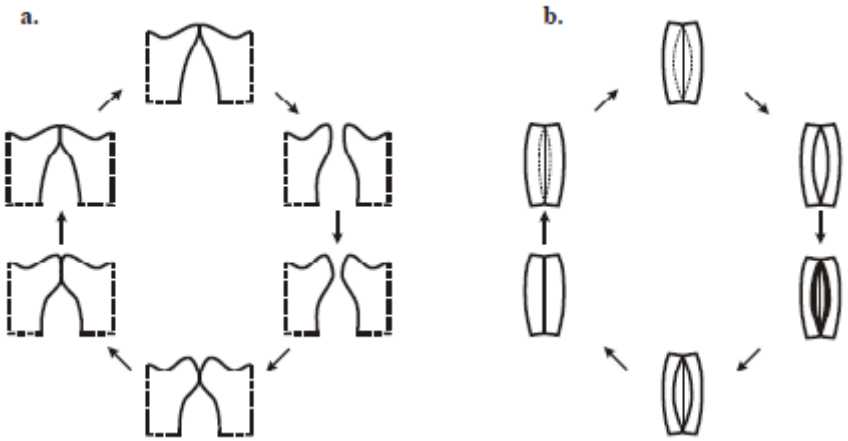

Figure 1: Schematic diagram illustrating the cycle of vocal fold vibration; picture a. shows the front view, picture b. provides a view from above the vocal folds (Adapted from Skarnitzl, 2011, p. 31).

Such phonation results in a quasi-periodic speech waveform, characterized by only slight differences in the duration, amplitude and shape of adjacent periods (Bőhm, Both & Németh, 2010). Gerratt and Kreiman (2001) focus on the acoustic perspective of modal phonation and suggest that it is "the range of fundamental frequencies normally used for speaking or singing" (p. 365).

Since modal phonation is defined as the "normal" or "standard" type of phonation, all kinds of vocal fold vibration which in some way fail to fulfil the conditions for modal classification have to be defined as not "normal" i.e. non-modal. In other words, non-modal phonation is an umbrella term covering various kinds of phonation which deviate in some way from the "usual" vocal fold vibration, since they interrupt the relatively fluent course of the phonation cycle. In acoustic terms, the deviation manifests itself in the irregularity of glottal pulses. They can vary from modal phonation in a range of characteristics: period, amplitude, or shape of the successive pith periods (Skarnitzl, 2004). These changed characteristics are responsible for creating the typical "impressions of an interruption, hoarseness or roughness" (ibid., p.1), and thus differentiate non-modal phonation perceptually.

Classification of non-modal phonation

Non-modal phonation is a phenomenon studied extensively not only by phoneticians but also by researchers from other academic areas, which are sometimes considerably distant from one another, such as biomedicine, physics or music science. Understandably, each discipline pursues different interests and examines the phenomenon from its own point of view. As a result, there is currently a large number of different terms to be found in literature dealing with non-modal phonation, which makes orientation in this topic more difficult. What causes further confusion is that some terms refer to different types of phonation or vice versa (i.e. different terms are used for the same kind of phonation). There was a notable attempt to unify the terminology from different fields initiated by Gerrat and Kreiman (2001) but more studies shedding light on the terminological chaos would certainly be appreciated.

We can employ the continuum (see Figure 2 below) proposed by Ladefoged (1971; cited in Gordon and Ladefoged, 2001) for a better illustration of different phonation types. This continuum can be applied to the majority of world languages, including English. It is defined in terms of the aperture between the arytenoid cartilages. As shown in Figure 2, the extreme end on the right side of the continuum is characterized by a maximal openness of the glottis,

breathy voice is situated roughly halfway between the right end and the centre of the continuum, the centre of the continuum is defined as regular modal voicing, i.e. modal phonation. Further, the area closer to the right end is occupied by creaky voice, which is defined by a small openness of the glottis. The continuum encloses by the completely closed state of the glottis, also known as glottal closure or glottal stop.

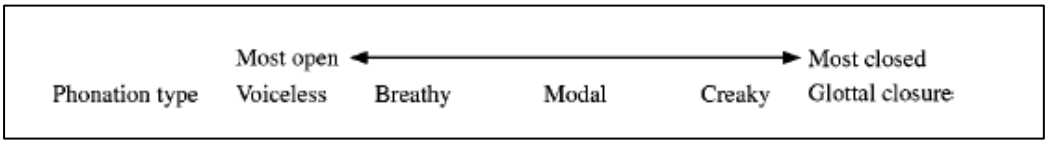

Figure 2: Continuum of phonation types (Adapted from Ladefoged, 1971; cited in Gordon & Ladefoged, 2001, p. 384).

If we project the modal/non-modal phonation distinction on the continuum, modal phonation corresponds to the central part of the continuum while non-modal phonation would cover the rest, i.e. both the right and the left side of the continuum.

For the purpose of our study, it will be sufficient to focus on those generally accepted categories of non-modal phonation which can function as a glottal stop.

Firstly, let us specify the use of the term glottal stop in this study. Some studies use the term to refer exclusively to a complete glottal closure, corresponding to the right end of Ladefoged's continuum. Other studies prefer to use the term glottal stop to encompass all realizations of irregular phonation with a distinctive acoustic and auditory expression, therefore covering not only the glottal closure but also, for example, creaky voice and breathy voice. To prevent any ambiguity we will employ the term "canonical glottal stop" to refer to the former phenomenon, while the terms glottal stop, glottalization, T-glottalization or T-glottaling will be used for reference to all gestures with a similarly perceptible glottal quality.

2.1.1 The Canonical glottal stop

In the majority of phonetics literature, the glottal stop is categorised as a stop, specifically as a plosive sound. The production of plosives is characterized by a complete obstruction of the egressive pulmonic airstream at some point on their way out of the vocal tract. Nasals, for example, also require the vocal tract to be blocked but unlike in plosives, the airflow escapes through the nose instead. The air blocked during the production of a plosive is abruptly released in the next phase. As the name of the consonant class implies, the suppressed air rushes out, creating a salient explosive sound. This process of production consists of three

phases: it starts with the closing phase, in which articulators move towards each other to create a stricture. In the following compression phase, the air is trapped behind the articulator/s and causes a gradual accumulation of pressure. By changing the position of articulator/s the pressure is consequently released and the airflow escapes again. The third phase is therefore called the release phase. Some accounts describe the plosion, i.e. the salient burst of noise, as part of the release phase, others distinguish the plosion as a separate fourth phase.

In some respects, the glottal stop occupies a special position among plosives. It stems mainly from its place of articulation, which is glottal, created by the vocal folds. The glottis, i.e. the opening between the vocal folds, which is necessary for phonation, plays the main role. "The tight closure of the glottis maintained for appreciable time" (Catford, 1977; cited in Docherty & Foulkes, p.1037) is called a glottal stop. Skarnitzl and Machač (2009) suggest that the closure should last approximately 40 to 70 milliseconds. In the acoustic waveform the release phase can be identified in the form of one or two irregular pulses (cf. Figure 3). David Crystal (2008) defines the glottal stop from the auditory perspective, pointing out that "the audible release of a complete closure at the glottis is known as a glottal stop" (p. 213). Since the acoustic manifestation is so unique, the auditory examination of a glottal stop is sufficient to identify its occurrence. The auditory impression of a glottal stop can be further perceived as a "gap" (when it occurs between vocals) or, idiomatically, as "a catch in the throat." It should be pointed out that the onset of sounds preceded by a glottal stop is significantly quicker than those preceded by any other speech sound.

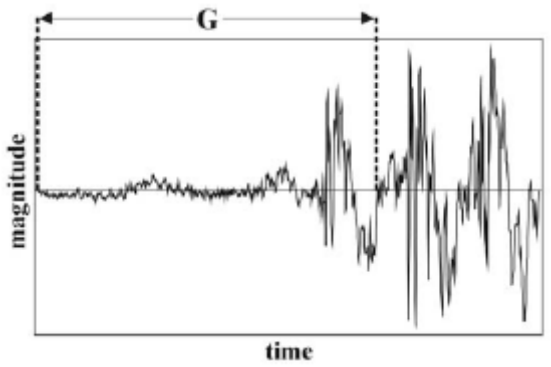

Figure 3: The waveform of a canonical glottal stop (Adapted from Skarnitzl, 2004, p. 4).

The majority of languages, including English, employ two points of contrast among plosives, distinguishing between voiced and voiceless sounds (Gordon & Ladefoged, 2001). In other

words, they distinguish whether the sound is produced with the vibration of vocal folds or not. The glottal stop is regarded as a voiceless sound and presented as such in the charts of the International phonetic association. This view is supported by the fact that the glottal stop can be employed as an alternative realization of voiceless plosives in English, (i.e. substitutional glottalization), for which we will provide sufficient evidence in this study. Moreover, it has a similar shortening effect on the preceding vowel to other voiceless plosives. In contrast to other plosives, the glottal stop does not have a voiced counterpart. As we have pointed out above, its production is characterized by the state of the glottis which does not allow for vibration, hence it cannot occur in a voiced form. However, some researchers consider the classification of the glottal stop as a voiceless sound to be debatable. For example, Cruttenden (2008) argues that for a sound to be taken as voiceless, it needs to be produced with an open glottis, and argues that the glottal stop falls neither into the voiceless nor the voiced category. Generally, the similarities to a voiceless sound prevail, nevertheless, Cruttenden's point reveals why the categorization of the glottal stop is a complex task.

We have categorised the glottal stop as a plosive consonant. In English, however, the glottal stop does not have the status of an actual phoneme. It functions as an allophone of voiceless plosives but cannot distinguish one word from another. Besides, it is considered a rather non-standard substitute. There are some languages of the world in which the glottal stop, however, has a sufficient contrastive function, for example Arabic (Roach, 1992) or Hawaiian (Ladefoged & Maddieson, 1996). Elsewhere, the glottal stop is employed to mark prosodic boundaries, as in German (Roach, 1992), where it occurs before word-initial vowels in stressed syllables, signifying the beginning of a new prosodic unit. Interestingly, there is a language called Gimi, spoken at Papua New Guinea, using the glottal stop for phonological contrast, which claims to have a voiced opposition to it (Ladefoged & Maddieson, 1996). It assumes the form of creaky voice. In Gimi, both voiced and voiceless forms of "glottal stops" occur in positions which are invariably occupied by voiceless sounds in the rest of the world's languages. However, to produce a truly voiced glottal stop is not physiologically possible. We are therefore speaking about a phonological opposition, not an articulatory opposition. Ladefoged and Maddieson (1996) explain that "this segment behaves like a glottal stop only from the phonological point of view. There is no indication of anything that would normally be called a stop, glottal or otherwise" (p. 70). Rather than calling it a voiced glottal stop they propose the term creaky voiced glottal approximant (ibid.).

In fact, instances of the canonical glottal stop are rather infrequent; particularly in languages where the glottal stop is non-contrastive, including English. One explanation is that the "proper" articulation of the glottal stop, i.e. the canonical form, requires a lot of articulatory effort. Humans have the natural tendency to save their energy and this applies to the energy used for speech production, too. When speakers produce a glottal stop, they often fail to press the vocal folds firmly enough to create a complete closure. As a result, they produce some form of non-canonical glottalization with irregular glottal pulsing which, however, does not fully stop. In this view, we may say that all forms of glottalization other than canonical are instances of hypoarticulation. In terms of perceptual effect, they are more or less similar, both are counted as glottal stops and the complete closure of the vocal folds is actually not necessary. It was revealed that it is the drop in amplitude and mainly the consequent drop in fundamental frequency, characteristic of all types of glottal stops, which is decisive in determining the presence of a glottal stop (Hillenbrand & Houde, 1996).

2.1.2 Creaky glottalization

As shown by the continuum in section 2.1, creaky voice comes closest to the glottal closure. This type of phonation is also termed creak, creaky phonation, laryngealization, or in certain contexts vocal fry. Due to their close similarity, a glottal stop can assume the form of creaky voice. In fact, creak is by far the most common realization of the glottal stop. It is commonly defined in relation to other kinds of phonation. Creak, for example, occurs in frequencies below those commonly employed for the modal register (Hollien, Moore, Wendahl & Michel, 1966; cited in Henton & Bladon, 1987). During its production, the vocal folds are pressed together more closely than in modal phonation, but unlike the canonical glottal stop, the glottal closure is not complete. In creak, although the vocal folds are tightly adducted, some of their parts are open enough to allow for vibration (Gordon & Ladefoged, 2001). The rate of vibration is, however, very low. The degree of opening during the production of creak may be measured using the opening quotient (OQ), which is the ratio of opening and closing of the vocal folds during the phonation cycle. According to Skarnitzl (2004), the OQ of modal phonation is 0.5, while for creak, the value ranges between 0.2–0.3.

The acoustic characteristics of this laryngeal configuration are usually a series of irregularly spaced glottal pulses (cf. figure 4 below). Gerrat and Kreiman (2001) further observe that the pulses are of "extremely low frequency, with almost complete damping of the vocal tract between excitations" (pp. 375–376). They based their description on a study by Coleman

(1963), who found the damping between cycles crucial for the perception of creak. When the damping does not occur, the phonation is considered modal (cited in Gerrat & Kreiman, 2001). Normally, the perceptual result of creak is described as similar to that of the canonical glottal stop, i.e. "an impression of either consonant-like abruptness and/or general lowness in pitch" (Redi & Shattuck-Hufnagel, 2001, p. 415).

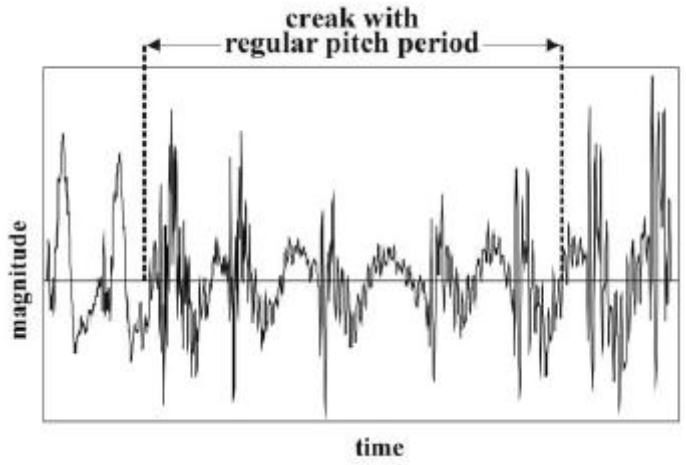

Figure 4: Acoustic waveform of creak with regular pitch periods. (Adapted from Skarnitzl, 2004, p. 8).

Creaky voice may be associated with further acoustic features: a reduction in overall acoustic intensity compared to modal voice, a less steep spectral tilt or the raising of the first formant (Gordon and Ladefoged, 2001). However, not all the mentioned features need occur concurrently. Various combinations of these cues may occur in the realization of creak and some researchers classify various combinations of creak-related phenomena as separate categories (Redi & Shattuck-Hufnagel, 2001). As a result, there is a confusing number of terms being used in relation to creak but since the alternative terminology has not been widely accepted, we will not go into further detail here.

In this study we will focus on creak as an allophonic substitution of voiceless plosives, i.e. an alternative realization of the glottal stop. In some languages, creak accompanies other segments, being superimposed on other sounds, especially vowels, and these combinations of sounds then function as means of phonological contrast. Consequently, for example, a creaky-voiced sonorant and a modal-voiced sonorant are considered separate phonemes. Frequently cited examples of languages which use creak for this distinction include the Northwest American Indian language Kwakw'ala, or a language called Jalapa Mazatec, which uses

creaky voice to distinguish the word /jɑ́/, meaning “he wears”, from /já/, which stands for “tree” (Gordon & Ladefoged, 2001).

2.1.3 Breathy glottalization

The two types of non-modal phonation we have so far discussed – the canonical glottal stop and creaky voice – appear to form perceptual categories on the phonation continuum which can be distinguished not only from modal voice but also from each other. Gerratt and Kreiman (2001) point out that breathy voice cannot be treated in the same way, as categorically different, but rather should be seen as continuously different from modal phonation. More specifically, they claim that we can determine the extent of breathiness in a voice, i.e. whether it is “extremely breathy” or “slightly breathy” (ibid.) etc., but it can be problematic to determine whether breathiness is present in a voice or not. In contrast, the presence or absence of creak is fairly simple to assess. In this light, breathy voice assumes a special position among phonation types.

Regardless of the rare nature of this phenomenon, breathy voice can give the same perceptual impression as the glottal stop, and therefore can also operate as its alternative realization.

Breathy phonation is associated with a laryngeal setting in which the vocal folds are more widely apart than in modal voice and significantly more so than in creaky voice. In fact, the opening is quite extreme, resulting in a higher vibration rate and a “turbulent airflow through the glottis” (Gordon & Ladefoged, 2001, p. 385). As the term suggests, the perceptual effect of breathy voice is usually described as “a voice mixed in with breath” (Catford, 1977; cited in Gordon & Ladefoged, 2001, p. 385). Several acoustically salient cues for breathy voice have been reported in literature. A detailed exploration by Gordon and Ladefoged (ibid.), revealed the following cues: increased spectral noise, decrease in acoustic intensity, lower fundamental frequency, or lowering of the first formant.

Like creak, breathy voice is imposed on vowels (i.e. breathy vowels) in some languages in order to create phonological contrast. One such example is the Gujarati language, spoken in India, which uses the breathy voice quality to distinguish between two words: the word /bar/ realized with breathy-voiced vowel which means “outside” from the word /bar/, in which the vowel is realized with normal voiced quality, meaning “twelve” (Ladefoged & Maddieson, 1996).

2.2 Functions of glottalization

Glottalization is a widespread phenomenon across the languages of the world. However, the notion of its function is not universally shared. Some earlier studies suggested that glottalization can imply boredom on the side of the speaker; it can also be used as a hesitation marker, whereas creak, by contrast, can be employed to make the speaker sound more masculine. While such accounts require further investigation before they may serve as the basis of any valid conclusions, there are four generally acknowledged functions which glottalization can serve: 1) phonological contrast, 2) linking function, 3) marker of prosodic boundaries, and 4) allophonic function.

2.2.1 Phonological contrast

In the two previous sections, examples have shown that glottalization can have a sufficient contrasting function to distinguish one word from another, either in the form of creaky vowels or breathy vowels. Although some languages take advantage of this possibility, in the English system, glottal stop is not a distinctive sound.

2.2.2 Linking function

In English, the occurrence of word-initial vowel glottalization is explained from the physiological point of view. Specifically, it serves as a means of overcoming difficulty in articulation when producing a vowel after a pause in an utterance. English only uses word-initial glottalization in exceptional cases. It typically relies on linking phenomena to avoid difficulties in articulation when it is necessary to "resolve hiatus, i.e. to separate adjacent vowels" (Šimáčková, Kolářová & Podlipský, 2014, p. 680). The specific means of linking are: pseudo-resyllabification, linking [r], intrusive[r], transient [j], and transient [w]. Although linking is the most frequently used strategy, glottalization can solve the physiological difficulty in the same way, thus it can be said that glottalization can occur in the absence of linking. For example, when we pronounce the word *four*, the final /r/ is usually not pronounced, however, when it is pronounced in a phrase: *four apples*, the linking /r/ might appear to link the words fluently together. Nevertheless, when the linking /r/ does not appear and the speaker aims to emphasise the second word, the initial vowel may be glottalized, whereby the words are linked. The two phenomena may seem to represent an equivalent means, but since glottalization has the additional effect of "boundary strengthening as well as the accentuation in emphatic speech" (ibid., p. 680), glottalization and linking, in fact,

represent opposite strategies – linking makes the production fluent while glottalization contributes to the emphatic discontinuity of speech (ibid.).

2.2.3 Marker of prosodic boundaries

Due to its emphatic nature, the glottal stop can highlight prominent parts of an utterance. Glottalization can mark prosodic boundaries when it occurs on the initial or final edges of prosodic phrases. Apart from its linking function, word-initial vowel glottalization can signal the beginning of a prosodic unit when it occupies the initial position (Luthern & Clopper, 2015). Let us illustrate this using the phrase *go away*: when the speaker decides to pronounce it with glottal stop [gəʊ ʔweɪ], the beginning of a word boundary is automatically emphasized. This phenomenon is very frequent in Czech but also in German, French, occasionally English, and other languages. As regards final prosodic boundaries, they can be signalled by another sort of glottalization, which is referred to as phrase-final creak. Henton and Bladon (1987) have examined phrase-final creak closely. According to their study, not only is it more likely to appear at the end of phrases, it is also associated with "the lateness of position in the sentence. It occurs at the end but also towards the end, thus creak is accumulating towards the final syllable where it is the greatest" (ibid., p. 20).

2.2.4 Substitutional glottalization

The function of glottalization which is of primary interest for this study is its allophonic realization. A glottal gesture sometimes substitutes or reinforces the voiceless plosives /p,t,k/. This phenomenon is termed substitutional glottalization or plosive-related glottalization. Nevertheless, /t/ is affected significantly more often than the remaining two plosives and this applies to the majority of British English dialects. Consequently, a large number of studies focuses only on the realization of /t/, which explains the origins of the popular term T-glottaling. In layman's terms, T-glottaling is sometimes referred to as "T-dropping" or "not saying the ends of words" (Roberts, 2006, p. 230).

Generally, there are two glottal variants described in British English. The first option is a full glottal replacement, i.e. a complete substitution of a voiceless plosive with a glottal stop [ʔ], whether its realization is creak, a canonical glottal stop, or in rare cases breathy voice. The following examples illustrate the phenomenon: *water* [wɔːtə] is pronounced as [wɔːʔə], or *better* [betə] is pronounced as [beʔə]. It is characteristic of glottal replacement to "lack not only formant transitions during the preceding vowel but also [t] release" (Seyfarth &

Garellek, 2015). The second glottal variant is called glottal reinforcement [ʔt], which involves the simultaneous occurrence of a glottal constriction as well as /t/, /p/ or /k/. For example, the word *lightning* [laɪtnɪŋ] is realized as [laɪʔtnɪŋ] or *right* [raɪt] as [raɪʔt].

During glottal reinforcement, the glottal gesture is produced before the oral gesture and ends before the following plosive is released. Due to the sequence of production it is commonly referred to as pre-glottalization. Unlike glottal replacement, formant transitions commonly accompany the [t] release here. Some sociolinguistic investigators appeal for these two variants to be treated separately. Others understand glottal replacement and glottal reinforcement as two points on a scale of lenition; reinforcement is simply seen as a weakened articulation of replacement, and this view is also adopted in the current study.

2.2.4.1 History of glottalization

Glottalization is a phenomenon that has had a long tradition on the British Isles, the earliest written mention was found by Andrésen and is dated to the late nineteenth century (1968; cited in Fabricius, 2002). There are accounts arguing that the glottal stop, in fact, occurred in speech many years before its existence was documented. Because it never functioned as a distinctive sound in English, it is likely that phoneticians did not pay much attention to it in their investigations. Nevertheless, the phenomenon should not be significantly older than 200 years since it does not occur in Australian English, which is believed to be derived from an earlier London variety (Cruttenden, 1994; cited in Fabricius, 2002). The glottal stop is believed to have originated either in Scotland or concurrently in Scotland (Glasgow) and in Southeast England (London) (ibid.). From these epicentres, glottalization likely spread into other varieties of English. Schleef (2013) found that the constraints influencing the variation of /t/ are very similar in all dialects of English, which he believes to prove that the diffusion scenario is more plausible than any scenario suggesting an independent development of glottalization.

Historically, glottalization was progressing in waves out of the epicentre, which Fabricius (2002) claims to be London. The individual stages of progression are characterized by different phonetic environments for T-glottaling. “The first wave is *t*-glottalling pre-consonantally, the second wave seems to be T-glottalling prepausally, the third wave *t*-glottalling pre-vocalically” (ibid., p. 126). (Examples and a more detailed description of the mentioned phonetic environments will be given in 2.3.1.) The fact that T-glottaling began in some phonetic contexts earlier than in others probably caused the glottal stop to be socially

differentiated based on its surrounding phonetic environment. This issue will be discussed later in the socio-linguistic part of the thesis.

Generally, the spread of glottalization was gradual and it was only in the last few decades that a rapid expansion started being observable. At present, evidence of increasing rates of glottalization is given in many studies based on various British dialects. Significant advances were achieved in particular thanks to Foulkes and Docherty (1999), who monitored the recent spread of T-glottalling in a series of studies throughout Britain, including the situation in Newcastle; Milroy (1994) examined the broader area of Tyneside and focused on word-final glottalization before vocals (as in *get it*). Further, T-glottaling was examined in London English by Wells in 1982, in Scotland by Reid in 1978 and Marshall in 2003; Straw and Patrick documented Ipswich English while Mees (1987) focused on Cardiff; Coggle monitored the situation in Estuary English in 1993 and Received pronunciation was examined by Wells (1997) and Fabricius (2002). (The overview of studies cited in Eddington & Taylor, 2009). In terms of glottalization in other varieties of English, we may find studies proving the presence of glottalization also in American English. Investigators were for some time mislead to the idea that glottal stop does not exist in American English because" the abundance of glottals in British English is found pre-vocalically (as in be[ʔ]er, pu[ʔ], a lo[ʔ] of), where American varieties often prefer to have a flap [ɾ]" (ibid., p. 298). However, glottal stops in pre-consonantal position (e.g. batman [bæʔmən]) are commonly found in American English (ibid.).

2.3 Factors influencing T- glottaling

Substitutional glottalization is a complex phenomenon especially because its occurrence is influenced by an interplay of linguistic, social and geographical factors. What complicates matters even further is the optionality of glottalization: even if all the conditions are met, it still does not ensure that glottalization will appear. In phonological literature, glottalization is commonly referred to as "an optional rule" (Pierrehumbert & Talkin, 1992, p.114). Its occurrence is made more likely by various factors, but their presence alone is not sufficient. The point of interest is not only the extent of the influence of the known factors but also additional factors which may play a role; although numerous studies have been conducted to shed light on the issue, these questions have not yet been fully answered.

In the following sections, we will examine those variables which are already generally known to have an influence on glottalization. They can be divided into two groups: linguistic and social.

2.3.1 Linguistic factors

Substitutional glottalization is restricted to a considerable extent by its position in a word. For a long time the linguistic constraints were even seen as the sole factors affecting whether or not glottalization will occur. However, later research revealed that social factors play a significant part as well. The position of a given variable can be examined on two basic prosodic levels: the position within a phrase (suprasegmental context) and the position within a word (segmental context). First, we will focus on the former.

Suprasegmental constraints

Glottalization shows different rates of distribution across various positions within an utterance. We have already introduced the tendency of word-initial vowel glottalization as well as word-final creak (section 2.1.2) to occur in positions with a certain prosodic significance**,** and as such these two types of glottalization were attributed a possible boundary-signalling function. While this function has been relatively well-examined in the abovementioned types of glottalization, substitutional glottalization has been, to our best knowledge, very poorly researched in this respect. Shattuck and Hufnagel (2001) only mention that English shows a general tendency towards glottalization at domain ends and a few studies confirm that voiceless plosives are more likely to be glottalized when they occur in final positions rather than non-finally. We decided, therefore, to examine the prosodic effect on T-glottaling in our speech samples. The influence of two prosodic levels will be investigated: 1) phrase level, i.e. the position of /t/ within a phrase, and 2) word level, i.e. the position of /t/ within a word.

Segmental constraints

Since both segmental context and stress patterns are taken to be the major factors influencing how /t/ will be realized, studies on glottalization typically focus on the surrounding phonetic environment. In one such study, Tollfree (1999) attempted to summarize the existing findings concerning the environment ideal for the occurrence of a glottal gesture: “it can occur after a preceding sonorant in coda or non-foot initial onset position, the latter referring to cases

where the stress on the syllable following /t/ is less than that borne by the preceding syllable, as in *better* or *guilty*" (cited in Schleef, 2013, pp. 201–202). In other words, T-glottaling avoids word-initial syllable onset positions and rather occupies word-medial (as in *getting better* [geʔɪŋ beʔə] and word-final positions *(*as in *put right* [pʊʔ raɪʔ]). Out of the two options, the distribution of the glottal variant is more frequent when /t/ occurs in the word-final environment.

In terms of the context preceding glottalization, Schleef's findings correspond with those reported by Roberts and Tollfree (ibid.), who found that /t/ preceded by vowels significantly increases the possibility of the occurrence of glottal stop and, in correspondence with Schleef, they add that the preceding context is not restricted to vowels - the glottal stop can follow other sonorants (nasals, liquids, glides and obstruents), too, as in *sent* or *belt*. Similar findings were reported by Seyfarth and Garellek (2015) in the study on coda glottalization in American English. Consonants, by contrast, tend not to be followed by glottalization in British English (Schleef, 2013).

Researchers often tend to focus their attention on the phonetic environment which follows rather than precedes /t/. The basic classification offers three possible options: 1) pre-vocalic, 2) pre-consonantal, and 3) pre-pausal context. The nature of the particular vowel or consonant might also play a role, however studies aiming to clarify this matter are rather rare in phonological literature. One exception is a study conducted by Pierrehumbert & Talkin (1992), who found out that T-glottaling is avoided before fricatives because the glottal opening gesture for a following fricative may conflict with the glottal constriction gesture.

The following phonetic context influences the frequency of occurrence of glottal stop in the following sequence: pre-consonantal > pre-pausal > pre-vocalic. The pre-consonantal context increases the possibility of the occurrence of glottal stop the most. In fact, pre-consonantal glottalization is considered an established feature in many varieties throughout Britain. While pre-pausal context is also common, the pre-vocalic context is known as the least favourable for T-glottaling.

Both segmental and supra-segmental contexts have their own constraints, but have to be in common interaction when determining the occurrence and position of glottalization. A study by Pierrehumbert illustrates this point by her finding that stressed syllables show high rates of glottalization in all positions while unstressed syllables show lower rates, one exception being the phrase boundary (ibid., p.114).

Grammatical category

In reaction to the insufficient number of studies dedicated to non-phonological factors which influence T-glottaling, Schleef (2013) decided to examine the effect of grammatical category and word-frequency in his study on glottal replacement in two British capitals. He found that function words (pronouns, prepositions, conjunctions, articles etc.), as opposed to content words (the study is focused on nouns and adjectives), favour glottal replacement. Similarly, progressives and past participles are susceptible to being glottalized. Although there are differences in the distribution of glottalization based on the grammatical category of the word, the effect only proved significant for /t/ in word-medial position, while no effect on word-final /t/ was detected.

The fact that function words (frequent examples are: *it, but, not, at, about, that, out*) favour glottal replacement is an expected development. Since grammatical category is closely related to the domain of stress, Phillips (1983) suggests that it is perhaps due to their low sentence stress that "function words are more susceptible to reductive processes" (cited in Schleef, 2013, p. 212) and glottalization participates in these processes as a possible result of these processes; from the point of view of "phonetic evolution, oral stops tend to develop a glottal place of articulation" (Eddington & Taylor, 2009, p. 298), which explains why /t, p, k/, when undergoing a reductive change, take the form of glottal stops.

Lexical frequency

In terms of lexical frequency, "frequently used words favour glottalization in word medial position" (ibid., p. 212). This finding goes hand in hand with the reductive sound change theory, because frequent words are naturally more likely to be affected sooner than less frequent ones. However, in word-final position, even very frequent words did not show any tendency to the glottal variant, which can be interpreted as evidence that the sound change is incomplete and still in progress, with the word-final position still to be affected in the latter stage of the process.

We have just presented two contradicting statements about the effect of stress on glottalization. On the one hand, it was pointed out that glottalization favours to appear in stressed syllables, on the other hand, the study of the effect of grammatical category revealed that function words, carrying low sentence stress, are more frequently glottalized than content words. This contradiction can be explained by the fact that glottalization is not only subject to

various constraints but also participates in a number of processes which may work against each other. The former case demonstrates the ideal phonological context for the occurrence of glottalization, which would lead us to expect that glottal stops should not appear in low-stress words. However, the interfering factor is the abovementioned reductive sound change, which aims to simplify the pronunciation which is achieved by the change of place of articulation to glottal. Therefore, the findings about glottalization are not necessarily contradictory, they merely reveal different mechanisms at work.

2.3.2 The social aspects of T-glottaling

The glottal stop entered the consciousness of the general public due to the social message which it used to convey about speakers who used it. Originally, it was a characteristic feature of London's Cockney as well as other vernacular or low-status dialects, and as such was long associated with male, lower- or working-class speakers. It was more than twenty years ago that Milroy, Milroy, Hartley and Walshaw (1994) reported T-glottaling, together with /h/ dropping, to be the most stigmatized feature of British English pronunciation. How the use of glottalization (particularly in some phonetic environments) used to be burdened with social stigma is aptly expressed in Coggle's comment: "Using the glottal stop between vowels is a bit like wearing a tattoo: whether you realize it or not, certain doors will be closed on you. It is a statement about you and about where you belong, or where you think you belong, in British society" (Coggle, 1993, p. 42). However, despite the overt stigma associated with glottalization some twenty years ago, in recent years the phenomenon has spread rapidly "into all social classes, styles and phonetic contexts" (Altendorf & Watt, 2008, p. 210). It is particularly frequent in London and the Southeast but there is strong evidence of the increase in glottalization in many other cities across Britain, including those where the phenomenon is a recent innovation; Knowles (1973) reported that while English spoken in Liverpool showed glottalization only marginally in the late 60s (cited in Milroy et al., 1994), nowadays its occurrence is fairly common in the area. An often cited example is a study by Trudgill (1988), who examined the area of Norwich twice in a time span of 18 years and reported that within this time period, glottalization spread as well as entered more formal speaking styles. The spread of glottalization into socially higher styles reveals that it has undergone or is still undergoing a language change which has dramatically changed native English speakers´ attitudes towards the phenomenon. More specifically: "what started as vulgarism is becoming respectable" (Wells, 1994, p. 201).

Glottal stop has been part of RP for some time. Evidence is given by Anne Fabricius (2002), who examined T-glottaling in the speech of young speakers of RP. It is, however, important to point out that two types of phonetic environments can be distinguished: those which are part of the prestigious dialect and those which are not. Altendorf and Watt (2008) call the latter group ”socially sensitive positions” (p. 210) for T-glottaling because they are reduced or avoided by higher social classes in more formal speaking styles. Fabricius (2002) agrees that “all the word-final environments can show T-glottaling while the word-internal environments can be divided between those which are part of RP and those which are not. Glottaling in word-internal syllable-final environments (for example in words: *football*, *Gatwick*) is accepted into RP, while T-glottaling intervocalically (as in *water*) and before syllabic /l/ (as in *bottle*) remains outside RP” (pp. 119–120).

The presence of the glottal stop in the prestigious dialect as well as the fact that the form is commonly referred to as a middle-class norm suggests that the stigmatized status of the glottal stop might no longer be prevalent. On the other hand, there are studies (Schleef 2013) which still show patterns of stigmatization, and recent phonetic literature (Altendorf & Watt, 2008) still distinguishes socially sensitive positions for T-glottaling. We therefore infer that the language change is not yet completed, but might still be in progress, at least in some parts of Great Britain.

At first sight, the process of a spread of a stigmatized feature may seem illogical. Yet, from the history of English we can draw evidence of other features which gradually lost stigmatization. In the late 19th century, “the so called broad [a] (such as in *path* or *dance*)” for example, undertook a long and slow journey from Cockney into RP (Milroy et al., 1994, p. 329).

The major point of interest concerning this language change is that the social re-evaluation of the glottal stop is gender-determined. In spite of glottalization being predominantly associated with male speakers, its spread is led by young middle-class women. In fact, it is the association of women with this feature that is seen as crucial in bringing about the change, i.e. ascribing it a higher social status (Gordon & Milroy, 2003). Sociophonetic literature on language change and variation can provide an explanation of this phenomenon. As we will discuss in the following sections, women are leaders of language changes, and thus are also the initiators of the large-scale process called “regional dialect levelling.” The process operates with two key terms: local and supra-local features, which reflect the geographical

hierarchy of linguistic forms. It leads to "the loss of localised features in urban and rural varieties of English in Britain, to be replaced with features found over a wider region" (Kerswill, 2002, p. 187). These include not only the prestigious variants but also the originally stigmatized ones. The glottal stop is, therefore, becoming more geographically "universal" (i.e. a supra-local form) and the greater geographical validity might help it enter higher styles. More importantly, it is due to the fact that female speakers favour this form (and the forms used by women are considered to be prestigious, see section *Gender* below) that the glottal stop is being elevated to the status of a standard feature of British English pronunciation.

It is evident that the phenomenon of glottalization has a strong social aspect. We will therefore focus in more detail on the social mechanisms which function as moving forces behind the spread of glottalization. We will examine the roles of social class, gender, age, dialect, and will conclude with the effect of speaking styles. The information will be drawn from two types of sources: descriptive socio-linguistic literature on language change and variation will form the basis, which will be supplemented with reports of existing findings from various studies concerned with the effect of individual social variables on the occurrence of T-glottaling.

2.3.2.1 Social factors influencing T-glottaling

Social class

Social class is treated by Labov (1972) as the major social variable. In his frequently cited study, the New York Department store survey, which serves as the basis for his social class theory, he presented a strong social stratification of the New York society. It is based on speakers´ use of the variable [r], which has its more and less prestigious realizations in New York (cited in Milroy & Gordon, 2003). The hierarchy covered all social classes: the upper middle class, lower middle class, working class, and lower class, and revealed the following arrangement: the top of the social scale is characterized by the most standard forms. The lower on the scale we find ourselves, the more likely we are to encounter non-standard or stigmatized linguistic variants. There was only one deviation: the lower middle class showed higher rates of use of the prestige variant /r/ in careful speech than speakers from the upper middle class group. "Labov interprets this irregularity as indicative of the important role of the lower-middle class in diffusing a change throughout the speech community following

their adoption and emulation of an innovative pattern introduced by a higher status group“ (Labov 1972; cited in ibid., p. 93).

The same kind of deviation, except that a low-prestige feature is being diffused, is observable in relation to the spread of glottalization, in which middle-class speakers are instrumental, rather than working-class speakers.

Although the fundamental sociolinguistic terms low-status and high-status/prestige feature suggest the primacy of social class as a variable, it is often treated together with, and in relation to, other extra-linguistic variables. In fact, some accounts argue that gender shows more evident effects than social class. An early study by Rigg (1987) examined the effects of both social class and gender on glottalization and summarized that while social class showed only subtle patterns of variation, gender proved to be a much more clarifying indicator. She concluded that “glottalization is much more coherently characterized as a male norm than a working-class norm” (cited in Milroy et al., 1994, p. 333). However, as is clear from the previous part, these findings do not correspond to today’s situation. Firstly, glottalization these days is led by women, secondly, it may be commonly heard in RP, which is primarily associated with higher social classes.

Gender

Bearing in mind the language change in which glottalization is participating, we will now examine what general principles of language usage say about its relation to gender. Labov was particularly active in this respect; the theories presented in his variation studies function as the main models for sociolinguistic investigations. He claims that women initiate linguistic differentiation. They create differences to distinguish themselves from men. Firstly, they tend to prefer prestige forms in language. Labov’s principle of language change and variation says: “for stable sociolinguistic variables, women show a lower rate of stigmatized variants and a higher rate of prestige variants than men” from the same social class and under the same conditions (Labov, 1990; cited in Milroy & Gordon, 2003, p. 93). Men, on the other hand, seem to be associated rather with socially lower or non-standard forms.

The second point of gender differentiation is related to linguistic change. While women are usually more conservative when using stable variables, they are more advanced when using innovative forms. Past research (Milroy, 1980; Labov, 1994; cited in Eddington, 2009). In other words, women are seen as the leaders of most linguistic changes.

The spread of glottalization does not seem to fit into Labov's first theoretical framework, which claims that women favour prestige forms, since the glottal stop used to be a typical example of a stigmatized feature. For this reason, we adopt Milroy´s point of view.

Milroy proposed a reinterpretation of Labov's gender patterns, stating that "it may not be that women favour prestige variants; rather, they create them, as the variants that females prefer become idealized as prestige variants. Rather, women seem very generally to prefer supra-local variants, which may or may not be identifiable as prestigious" (Milroy & Gordon 2003, p. 103). Milroy and Gordon emphasize that whether women adopt a feature depends on its geographical range rather than its established prestige. In contrast, men show a tendency to prefer local, vernacular forms, which are frequently socially stigmatized. Chambers (1992) provides the following explanation of female speakers´ preference of supra-local forms: "Women characteristically use a wider range of variants and control a wider range of styles than men from the same social group" (cited in ibid., p. 352). Chambers (1992) links this behaviour to gender-related social patterns: "mobility norms for men and women differ in that men tend to be locally oriented, while women tend to have more social and geographical range and breadth" (ibid., p. 352).

Let us now present an overview of studies focused on gender-related patterns in the occurrence of T-glottaling. With a few exceptions, the overview reflects the changing status of the glottal stop. While older studies show gender patterns suggestive of a negative social evaluation, more recent studies tend to show the reversed patterns. The oldest data come from a study conducted by Henton and Bladon (1987). It revealed that in two dialects (Modified Northern and RP), male speakers used the glottal stop significantly more often than females. Similarly, Rigs (1987), who examined the area of Tyneside, confirmed higher rates of glottalization in men than in women. On the other hand, Mees (1987) and Mees and Collins (1999), who focused on the occurrence of glottalization in Cardiff speakers, already reported the reversed situation. Similarly, Milroy et al. (1994) and Docherty et al. (1997) found that women used the glottal stop more frequently, although the interpretation of findings from these two studies is more difficult, since they distinguish between patterns of glottal replacement and glottal reinforcement. While women use glottal replacement much more often (which is considered a supra-local form), men use glottal reinforcement more frequently (the more localized variant). Kingsmore (1995) examined the situation in Colerain in Northern Ireland with the same result. Likewise, some studies on American English showed this tendency in women: Byrd (1994), Levon (2006) in New York, Eddington and Taylor

(2009.) However, a recent study by Schleef (2013) detected no gender differences in the use of glottalization. (Those studies, from the overview above, which are not included in the reference list, are cited in Milroy & Gordon, 2003).

Age

Age plays a crucial role in determining a language change, or in our case a sound change. Sociolinguists typically need to compare data from different generations of speakers to decide whether a pattern of variation can be considered a language change, and further whether the change is still in progress or already completed. We suppose that "people of different ages can be taken as representatives of different times" (Milroy & Gordon, 2003, p. 35), and thus possible differences among generations are taken as proof of a language change.

Studies on the changing status of glottalization often examine the variation patterns based on age differentiation, seeking contrasts between the data of older versus younger generation of speakers, in order to reveal whether the status of glottalization has changed and glottal stop is becoming an accepted, standard feature in a certain area. For example, Trudgill (1988) suggests that the older generation in Norwich avoids frequent usage of the glottal stop, which implies that they still perceive the feature as stigmatized, while the younger generation, already affected by the changed evaluation, does not feel any need to limit themselves in the usage.

Another principle which emerges from the relation of age and language change is that younger speakers generally use higher rates of innovative forms, and thus are usually the leaders of language changes. This finding is consistent with the general observation that glottalization in Britain is usually associated with younger speakers. The following overview of studies from various English-speaking areas confirms this tendency: Macaulay 1977, Mees 1987, Holmes 1995, Tollfree 1999, Marshall 2003, Partin-Hernandez 2005 (the overview cited in Eddington & Taylor, 2009). Moreover, Eddington (2009) confirms that young females use the glottal stop more often than any other group of women. Male speakers showed lower rates of glottalization than women, except one group of young men, which suggests that age shows stronger effects on glottalization than gender.

Style

The concept of style as Labov (1972; cited in Milroy & Gordon, 2003) understood it is closely linked to the notion of social class. He observed that speakers generally tend to employ a

stylistic variation characteristic of a higher-status social class on more formal occasions, while during informal or casual situations, speakers incline towards more natural, vernacular, or even stigmatized stylistic variants of speech. The decisive factor here is the amount of attention paid to speech rather than the formality of the content. On the other hand, the less attention the speaker pays to his speech, the more natural, non-standard data he is likely to produce. This fact is of major importance for linguistic research. However, in order to collect such data, we need to overcome Labov's Observer's Paradox, i.e. we have to "observe how people speak when they are not being observed" (1972; ibid., 49). As an instrument to overcome this difficulty, Labov invented the sociolinguistic interview, designed to maximally distract the interviewee's attention and prevent him from realising that he is being observed or recorded. A variant of this interview was used while recording the data for our study. Since a stigmatized feature is, according to Labov's theory, avoided in more monitored speech styles, the glottal stop should be suppressed in reading tasks, while its occurrence should be more frequent in informal styles. Some findings confirm this theory, such as the study conducted by Anne Fabricius (2002), who concluded that T-glottaling is subject to style-shifting. Her claim is supported by an analysis of reading and speaking data from RP speakers, which shows significant differences in the rates of glottalization between reading style and interview style. In certain positions, specifically in pre-pausal and pre-vocalic context, T-glottaling was avoided in reading style, while in speaking style glottalization seems to be distributed freely.

On the other hand, research on glottalization in American English arrived at different conclusions. Eddington and Taylor (2009) reported that young women use it more than half of the time in formal contexts which suggests that glottalization might be a fully accepted feature in some areas of the US.

Dialect

So far we have referred to numerous studies on glottalization conducted across various parts of (not only) the United Kingdom which show that the glottal stop is widespread not only geographically but also socially across the English-speaking world. The glottal stop is now considered a feature of stereotypical urban speech (Milroy et al., 1994) and can be overheard in working-class speech as well as in RP. It occurs in many dialects, but in some, the glottal stop may tend to affect different plosive consonants than in others. For example, in Newcastle, /p/ is glottalized, specifically glottally reinforced (since Tyneside characteristically prefers this realization over glottal replacement) more than /t/ or /k/ (Milroy & Gordon, 2003).

In London, by contrast, it is /t/ which favours glottalization the most. Similarly, linguistic or social constraints of the use of glottal stop may vary across dialects. Moreover, speakers of different dialects can show different preferences in the individual realizations of glottal stops.

Another point of difference is that "while T-glottaling is in the process of ongoing language change in some parts of the UK, it may well be a stable, regularized dialect feature in other areas" (Schleef, 2013, p. 202). According to Kerswill (2002), the glottal stop is historically more established in the south of Britain than in the north. However, these dialect differences are becoming increasingly blurred due to "regional dialect levelling", in which T-glottaling participates, and which we described in previous sections. Kerswill specifies that the mechanism behind this process of regional dialect levelling might be a "geographical diffusion by which features spread out from a populous and economically and culturally dominant centre" (Trudgill, 1983; cited in Kerswill, 2002, pp. 187–188). Within Britain, the source of all kinds of innovations, including the linguistic ones, is London. "Its working-class accent is today the most influential source of phonological innovation in England" (Wells, 1982; cited in Kerswill, 2002, p. 207–208).

The crucial influence of London, especially on the Southern speaking communities, was examined in detail also by Kerswill. He believes that the high rates of T-glottaling, particularly among young speakers in southern areas, should be ascribed to the proximity of London as well as the presence of the glottal stop in other southern dialects (Kerswill, 1999).

Although we have introduced a number of general expectations in relation to social factors influencing T-glottaling, the theories are far from universal and should be understood as general tendencies. All sociolinguistics theories, including those we presented in this study, are based on an extremely complex interplay of factors, and thus we will inevitably encounter conflicting or contradictory studies.

2.4 Hypothesis and research questions

In the experimental part of the thesis we will examine the occurrence of T-glottaling in the speech of British English speakers. More specifically, we would like to monitor the social status of the glottal stop in the southern area of England. Our aim is to find out whether the feature is still undergoing the process of language change, i.e. whether the rates of glottalization imply that the form might still be associated with some degree of negative evaluation, or whether the rates of usage rather suggest that speakers might already accept the

glottal stop as a standard form. In order to answer this question, we will explore the effects of three sociolinguistic influences, gender, age and speaking style, on the occurrence of glottalization.

We base our expectations on the analysis made in the previous sections:

1) Gender hypothesis: Women show higher rates of glottalization.

The assumption is based on the gender theory which claims that women favour innovative linguistic forms and are, therefore, leaders of language changes.

2) Age hypothesis: Younger speakers glottalize more frequently than older speakers.

We expect the older speakers to represent the old language situation. While the older speakers should feel the stigmatization of the glottal stop, the younger speakers, as the linguistically more innovative group, should have no reason to avoid its use.

3) Style hypothesis: Glottalization is more frequent in spontaneous speech.

The stigmatized variants are usually suppressed in more formal styles. Provided that the language change is still in progress, we expect the speakers to be more self-conscious about the use of glottal stops. This should result in lower rates of glottalization in reading in comparison to spontaneous speech.

Further research questions:

1. Does the prosodic position (phrase and word level) influence the occurrence of glottalization?

2. How does the preceding and following segmental context constrain T-glottaling?

3. Is there any significant difference in the occurrence of glottalization based on the semantic status of the target word?

3. Method

3.1 Participants, Material, Recording

The material processed for this study consists of 32 recordings of native speakers of British English. Participants were non-professional speakers coming from different social backgrounds. The majority of them, however, were university employees, students or alumni. The primary factor for the selection of speakers was their English origin. Based on this limitation, only those participants who were born and raised in England were selected for the recording. Two other selection criteria were gender and age, thus four groups of participants, providing potential contrast, were formed: young women, aged 17–30; old women, aged 35–68; young men, aged 17–30; and old men, aged 35–72.

The speakers were first asked to perform a reading task of a short informal text, a fable called The Boy Who Cried Woolf, which was designed to elicit various realizations of /t/ where glottalization could occur. Interviewers made sure the participants always had several minutes to familiarize themselves with the text before the recording started. In the second part of the procedure, the participants were interviewed. All of them were addressed with the same questions, which were based on a model of the sociolinguistic interview described in the "style" section, but the participants were not restricted by the given themes. Since the aim was to obtain as spontaneous speech as possible, the speakers were encouraged to elaborate freely on any other subject, and thus topics of conversation vary considerably across individual interviews. In effect, the recorded materials are considered to be only semi-spontaneous: although we tried to facilitate a casual atmosphere, the whole situation ideal for recording was too artificial to allow for a completely natural response. The participants were recorded individually, some of them at the Department of Psychology at the University of Reading (UK) in a sound booth room equipped with high quality devices. Other speakers were recorded with a Tascam DR-07MKII recorder at various locations in Reading, always, nevertheless, in a calm and quiet place. Due to an insufficient number of speakers, one recording had to be accomplished additionally in Prague, using an Edirol R09-HR recorder. The device was always set to the following parameters: WAV 16bit and sample rate 48 kHz. In summary, the collected material comes from two interviewers and was recorded with three different devices at many different places, which reflects the complexity of not only recording in a foreign country and with unfamiliar participants of all age groups, but also of involving a

relatively high number of participants in the research. However, the diversity of our material should not have any relevant effect on the phenomenon examined in this study.

3.2 Data processing

The computer programme for phonetic analysis Praat 6.0.07 (Boersma & Weenink, 2015) was used to annotate the sound files with Text Grids and transcribe the chosen passages orthographically. While the reading task took one minute on average, the length of the interviews varied significantly, according to how willing the speaker was to relax and talk. To unify the amount of data, only five-minute long passages were cut out from each interview for further analysis. We always chose those parts where the participant spoke freely and with the least possible encouragement from the interviewer. The next step of the procedure was the segmentation of words into individual phonemes and separating them by pauses, this was accomplished with the help of the segmentation programme Penn Phonetics Lab Forced Aligner (P2FA; Yuan & Liberman, 2008). The recordings were listened to again, and the target positions, as described in the next paragraph, were hand-labelled.

The aim was to code each realization of /t/ in the target position, i.e. /t/ following a stressed syllable, which resulted in a group of primarily monosyllabic or, less frequently, polysyllabic words, excluding examples such as *mountain*, *safety* or *forest.* This approach would also exclude most instances of grammatical words, since this type of words often avoids carrying stress. Only a few exceptions could be used, for example the stressed particle *not*, which was indeed very frequent in our data. Eventually, the decision was made to code for all grammatical words, such as *that, it, at, but, about*, whether they were stressed or unstressed, so as to avoid losing a considerable amount of data.

A few other points should be mentioned in regard to the selection of target words. Some words, such as *exactly* or *next (to)*, were sometimes realized as /ɪgˈzæk.li/ /neks tʊ/ without the target variant of /t/, in which case they could not be coded for as potential candidates. Further, several items had to be excluded due to excessive background noise, imprecise articulation or speaker overlap.

Our study examines the variable realization of /t/, more specifically, it distinguishes three alternative realizations: [t], [t^h] – aspirated /t/, and [ʔ] – glottal stop. The assessment of particular variants of /t/ was based purely on auditory analysis. Both the glottal stop and

aspirated /t/ are known for their extremely salient auditory characteristics. The characteristics of the glottal stop have been described in sections 2.1.1 - 2.1.3. The aspirated /t/ is characterized by a strong burst of air. For this reason, and also because it is in line with most sociolinguistic investigations of glottalization, we considered the impressionistic approach a reliable criterion for our decisions. In terms of the realization of the glottal stop, all three types (as discussed earlier) were identified in our data: the canonical glottal stop, creak and breathy glottalization. The realization of a glottal stop as creak was, however, by far the most frequent one. The individual realizations were not marked and we did not attempt to distinguish between glottal replacement and glottal reinforcement, because we were primarily interested in whether the glottal stop occurred or not, regardless of its specific type.

A slightly problematic situation arose when two types of glottalization were found to interfere, namely substitutional glottalization and word-initial vowel glottalization, as described in section 2.2.2. These were contexts in which word-final /t/ neighboured with an initial vowel, as in *get out.* These instances were resolved according to the following rule: when the vowel of the first word is stressed, the glottal stop is seen as belonging to both words. In the first word it functions as a substitute for a plosive, in the second word as a means of linking.

After all target words were identified and marked, the Praat script was used to extract the data and import them into Microsoft Excel. With the help of Excel filters, we correlated the data with sociolinguistic factors. Specifically, we distinguished the following categories:

1) Gender – the names of speakers were coded implying their gender:

Female speakers: F01–F16

Male speakers: M01–M16

2) Age – The speakers were divided into four groups on the basis of their gender and age: young women, young men, old women, old men. Table 1 below defines the individual age groups. The smallest age difference across groups, i.e. the difference between the oldest person in the young group and the youngest in the oldest group, is 5 years in each case. It should be pointed out that only a few participants in both "old groups" were in their 30s or 40s, and thus the age spans are, in fact, not as wide as the table 1 suggest.

Table 1: Participants by gender and age

	Young	Old
Female	17–30	35–68
Male	17–30	35–72

3) Speaking style – reading, i.e. a more formal style, or spontaneous speech, i.e. informal style.

4) Realization of /t/: Initially, three categories: *plain, aspirated, glottalized* were marked. However, the aspirated /t/ category proved to form an insignificant group in relation to the total number of words: only 83 out of 2623 words (3.2%) were aspirated. For this reason, we decided to discard this category.

5) Word class of the target word: lexical or grammatical word

6) Position within the word: We distinguished between internal (as in *butter, better*) and word-final position (as in *get worse, not really*). In addition, we established a special category of "prefinal" position. Typical representatives are *it's, that's* and plural forms such as *sports, yachts*. Since many words fell into this category, and occasionally showed glottalization, we decided not to discard them.

7) Preceding phonological context: The type of phoneme preceding the target realization of /t/. Four categories were distinguished:

vowel

sonorant (nasals, liquids)

fricative – this heading also covers affricates; as we have discussed earlier, the occurrence of a glottal stop after a fricative or affricate (the production of affricates requires the same gesture which as fricatives, conflicts with the glottal closure) is quite rare, we considered it unnecessary to establish a separate category for it.

plosive

8) Following phonological context: We distinguished whether the target realization of /t/ was followed by a vowel, a consonant or a pause.

9) IP final position: This category is based on whether the target word appeared at the end of an intonational phrase or elsewhere.

Statistical analysis

The data was processed using the statistical computing programme R (R project, 2008). In R, we obtained the total counts which revealed different rates of glottalization for different categories. In order to gain maximally precise answers to our hypotheses and research questions, we needed to compare the differences and determine whether the results are statistically significant, i.e. whether they were caused by actual factors or whether they are the result of chance. The statistical analysis was conducted using the chi-square test.

The first step was to create contingency tables in Microsoft Excel and arrange figures for a comprehensive presentation. We compared differences in the rates of glottalization with various combinations of sociolinguistic factors. For instance, we were interested in the occurrence of glottal variants in the speech of women as opposed to men. The resulting formula of each statistical test consists of the $\chi 2$ value, the number of degrees of freedom, total number of realizations, and finally the *p* value, which helps determine the level of significance for our results. (An example formula: $\chi 2$ (3, n =171) = 11.99; $p < 0.01$).

The ranges of *p* value are, according to Volín, divided into three categories for the humanities. The $p < 0.1$ is considered only a marginally significant result. The values $p < 0.05$ are seen as significant. The boundary for a highly significant result is $p < 0.001$ (Volín, 2007, p. 36–37).

4. Results

The previous sections of the thesis explain how the material was processed; in the following part, we are going to present the results of the analysis. Primarily, the occurrence of glottalization in British English will be described in relation to gender and age. Further, the influence of speaking styles will also be considered. Secondary focus will be on the analysis of differences relative to the prosodic position of the items, segmental context, and semantic category of the word.

Let us start with a more general observation. After excluding the aspirated category, the total number of /t/ realizations in the target positions amounted to 2539 items, out of which 1113 (44%) were glottalized. Therefore, our data showed a fairly high rate of overall glottalization, which implies that the sample of speakers fits into the predominant language development on the British Isles.

It should be pointed out, however, that the number of tokens per speaker varies considerably. For example, speaker F10 provided only 45 target words and speaker F16 only 49 target words. By contrast, we used 132 words from speaker F08 and 107 words from the participant coded as F07. For the rest of the group, the total number of target words per speaker (including both read and spontaneous speech) ranged from 60 to 90.

Gender

A classification of our data based on the criterion of gender confirmed our first hypothesis, which proposed that women are initiating the spread of the glottal stop. As shown in Figure 5, the rates of glottalization are higher for women than for men, although the percentage value of the difference has perhaps a higher informative value. While women glottalize 49% of the items on average, men use the glottal stop only in 39% of cases. According to the chi-square test, this difference is highly significant: X^2 (1; n =2539) =26.5; p <0.001.

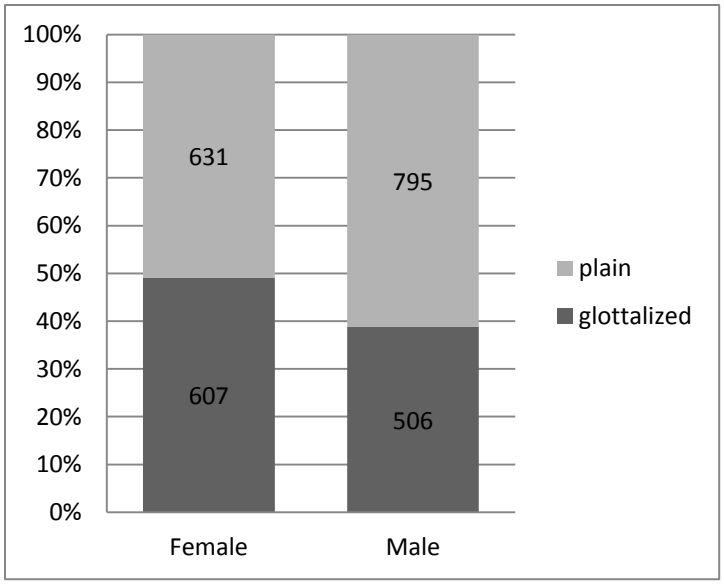

Figure 5: Overall numbers of realizational variants of /t/ relative to gender.

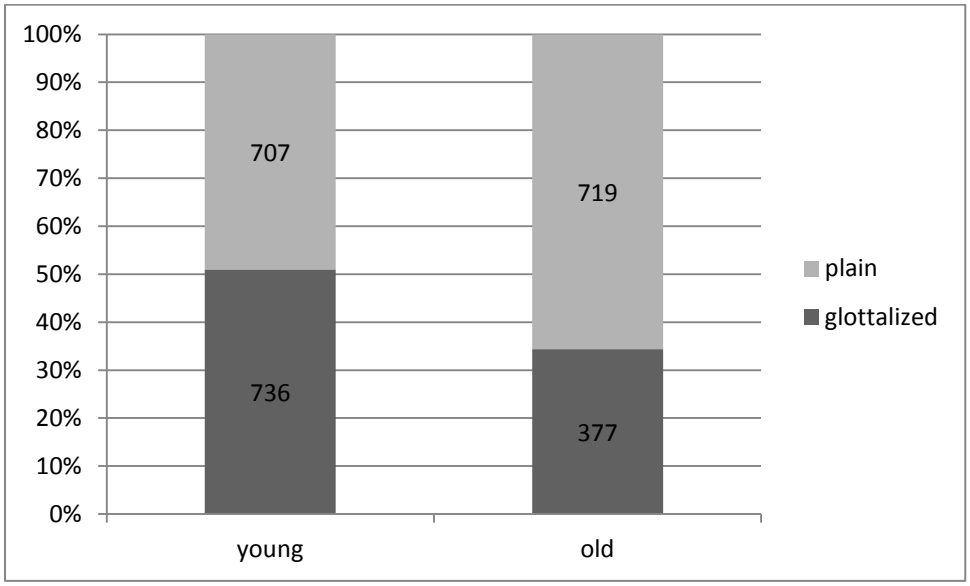

Figure 6: Percentage of glottalized versus non-glottalized items for the young and old age groups.

Age

Another major factor which influences the occurrence of glottalization is age. Figure 6 above illustrates that young speakers show a preference for the glottal variant with 51% of the items glottalized. By contrast, older speakers glottalized merely 34% of cases, showing a clear preference for the non-glottalized realization of /t/. The differences between genders are,

according to the statistical test, highly significant, i.e. X^2 (1; n =2539) =69.8; p <0.001, i.e. our second hypothesis has been confirmed as well.

Since age and gender are the key factors in our study, it is worth considering the effect of their mutual interaction, which further enables us to determine which of the two factors has a stronger influence.

Figure 7 below presents differences among groups of speakers defined by age and gender. It is apparent that younger females favour glottalization the most of all groups, in fact 57% of all tokens were realized with a glottal stop. In contrast, older males show the lowest rates of glottalization with 27% items glottalized. Interestingly, younger males (46%) show slightly higher rates of glottalization than the group of older females (41%), which suggests that age is a stronger factor than gender.

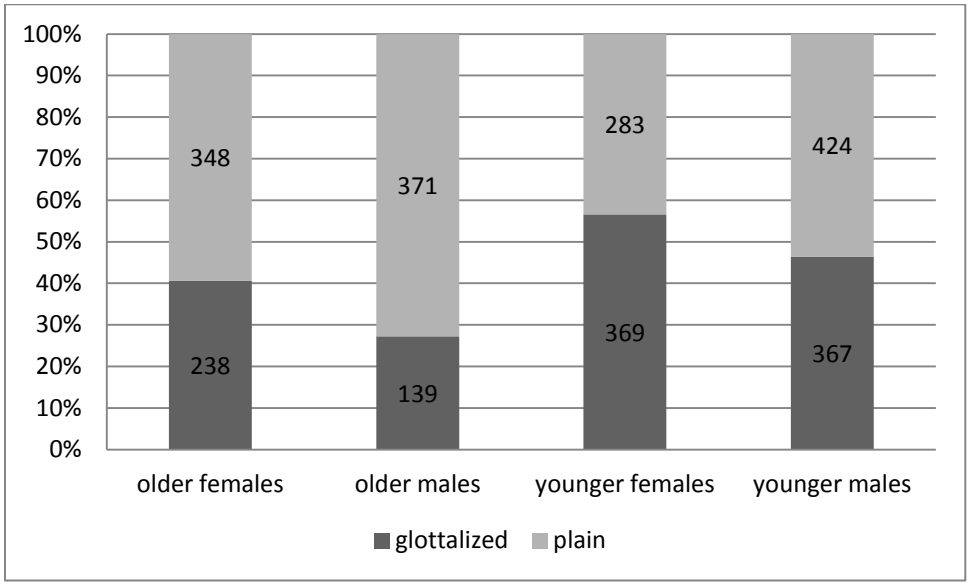

Figure 7: Percentages of glottalized and non-glottalized items for all combinations grouped by age and gender.

Speaking style

Regarding the influence of speaking style, Figure 8 below illustrates that T-glottaling increases significantly in spontaneous speech, as was expected in our third hypothesis. While only 30% of tokens were glottalized in reading style, spontaneous speech increases the rates to 48%. It is not surprising that the statistical test ascribed high significance to such a difference: X^2 (1; n =2539) =60.3; p <0.001. The fact that the use of the glottal stop seems to

be dependent on style further suggests that T-glottaling is subject to style-shifting (for a more detailed commentary, see Discussion).

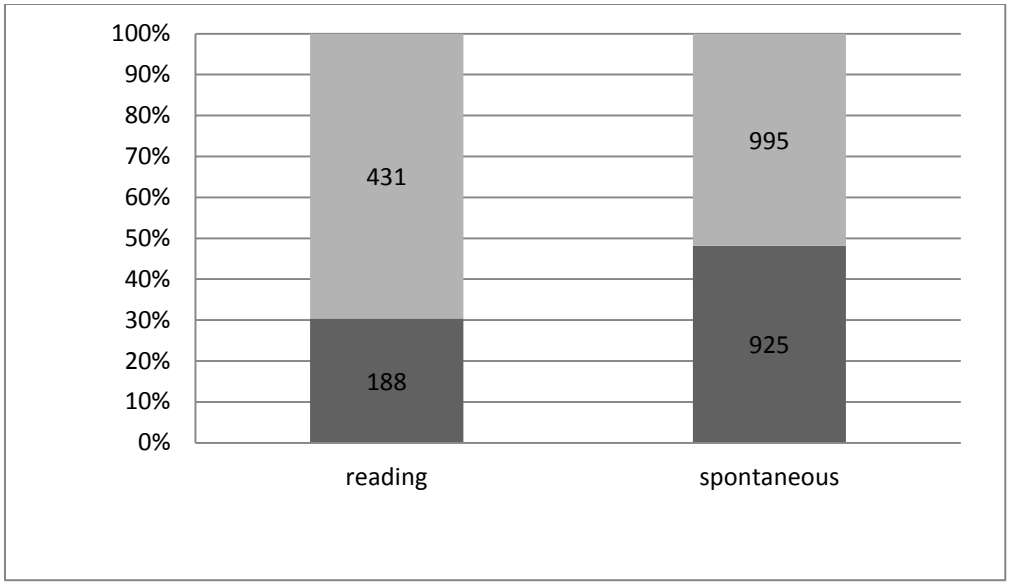

Figure 8: The percentage comparison of glottalized and non-glottalized tokens in passage reading and spontaneous interview.

In further analysis, we decided to combine all the previously examined factors. Figures 9a and 9b provide the percentage illustration of the glottalized and non-glottalized tokens for both speaking styles in interaction with gender and age, forming the following categories: old females, old males, young females and young males. Young females lead the usage of glottal stop in both styles, while old men show the lowest rates with only slight regard for the style. Interestingly, while in reading style old females show higher rates of glottalization than young men (suggestive that gender is a stronger factor), in spontaneous style the result is the opposite, i.e. young males show slightly more glottalization than old women, suggesting a greater influence of age than gender.

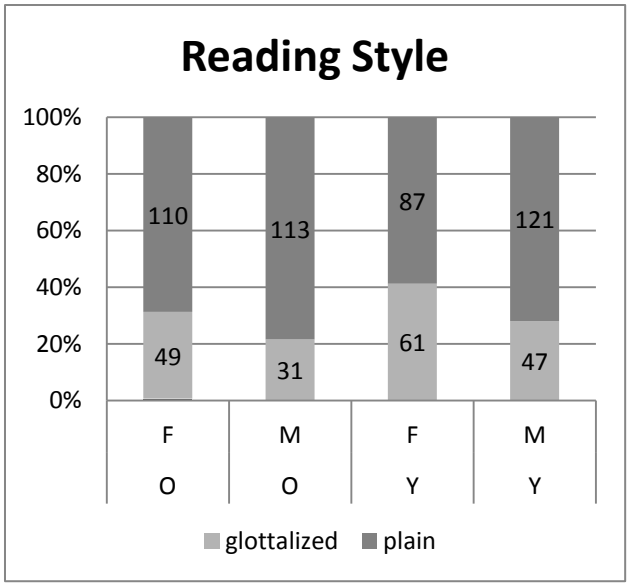

Figure 9a: Percentage of glottalized and non-glottalized tokens for each gender-age group in passage reading style.

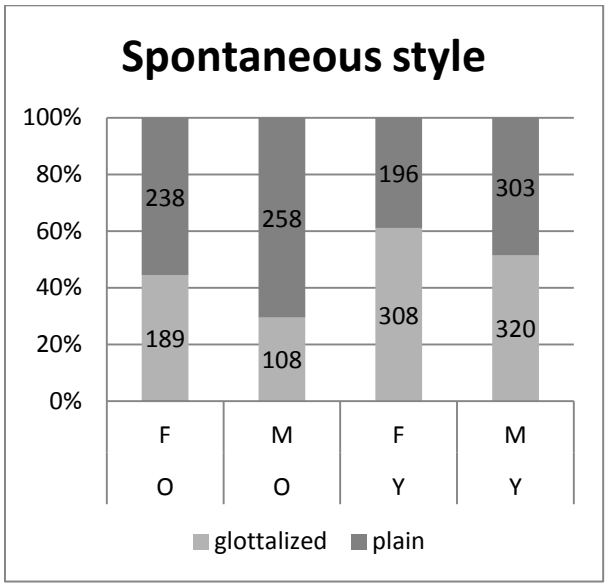

Figure 9b: Percentage of glottalized and non-glottalized tokens for each gender-age group in spontaneous style.

Now we will concentrate on the influence of purely linguistic constraints. First, we will examine the effect of prosodic position, specifically whether the target word occupies a phrase-final or non-phrase-final position. Figure 10 shows there is merely a slight contrast between the two positions. In the phrase-final position, 48% of the target words were glottalized, while in all other positions, the glottal stop was used in 43% of cases. The difference between the two positions proved to be statistically significant X^2 (1; n =2539) =4.14; p <0.05.

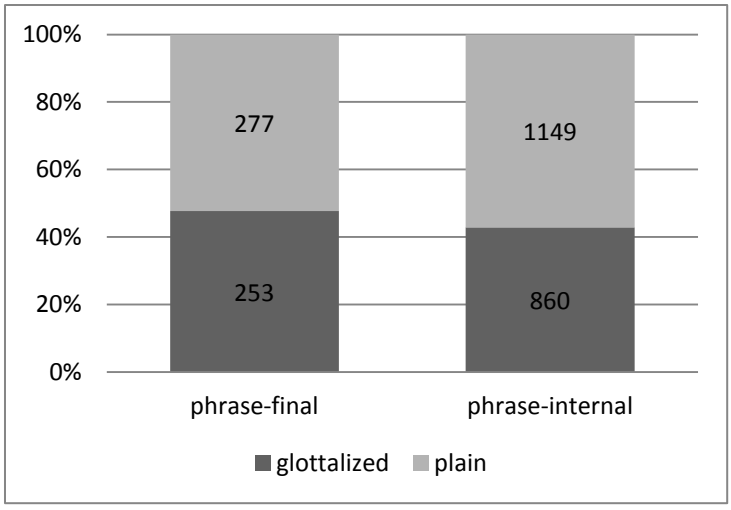

Figure 10: The occurrence of glottalized and non-glottalized tokens, depending on whether the target word occurs phrase-finally or not.

Table 2: Distribution of glottal stop depending on word-position.

word-position	glottalized	plain
internal	62	195
pre-final	35	350
word final	1016	881

A substantially greater number of tokens (75%) occurred in word-final position, (cf. Table 2). The second finding apparent from the overview is that word-final position is the most frequently glottalized out of all positions. In word-final position, /t/ is realized by a glottal stop in 54% of cases, internally it amounts to 24% and the least favourable position seems to be pre-final, in which only 9% items are glottalized. Statistically, the difference was confirmed as highly significant: X^2 (2; n =2539) =302; p <0.001.

In further analysis, Figure 11 below correlates findings from Table 2 with the gender aspect. Based on the findings we presented earlier, there is no deviation from the expected patterns: females have a head start in the usage of glottal stop for all three positions and the frequency of the usage goes in the following order: word-final > internal > pre-final.

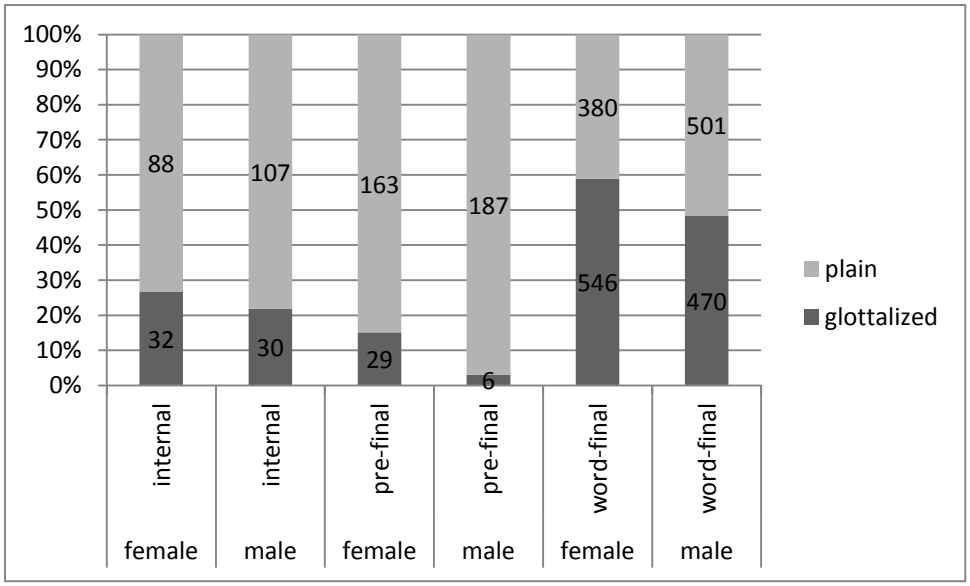

Figure 11: Glottalization according to the position within the word, divided into groups by gender.

Investigation of the preceding segmental context shows very clearly (see Figure 12 below) that a preceding consonant tends to disfavour glottalization, whereas a preceding vowel favours it. When vowels occurred before /t/, in 49% of cases it was glottalized. Only 19% of the instances of /t/ preceded by sonorants showed glottalization and merely 3% of glottal stops occurred preceded by fricatives. Although the "preceding plosive" category showed a 5% tendency towards glottalization, due to the negligible amount of tokens in this category, no significance can be ascribed to the finding. Overall, the preceding context constrains T-glottaling to a large extent.

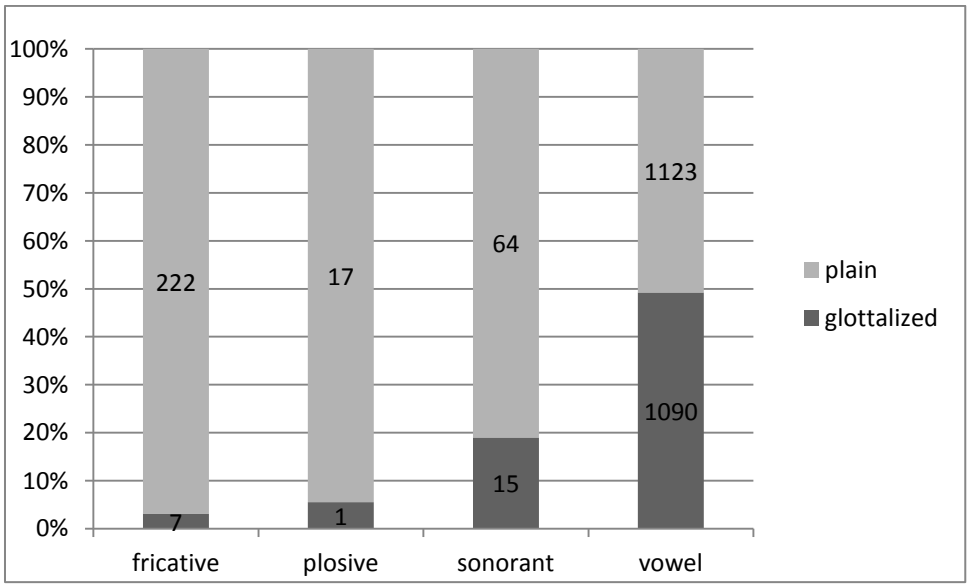

Figure 12: Percentage of glottalized tokens according to the preceding segmental context.

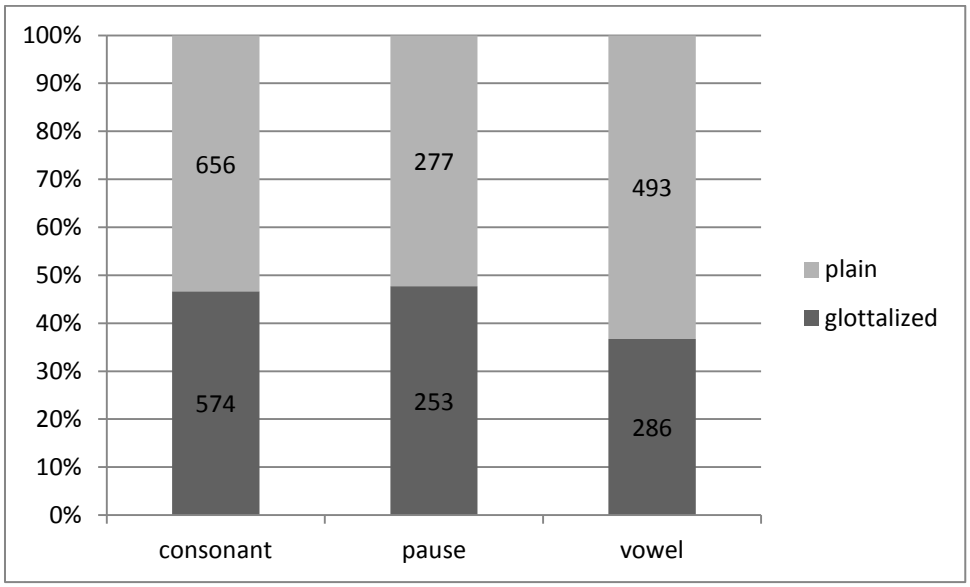

Figure 13: Rates of glottalization for /t/ followed by three types of segmental contexts.

As opposed to the "preceding segment" category as discussed above, tokens of the "following segment" category are distributed relatively equally across the individual categories, i.e. pause, consonant and vowel (see Figure 13 above). Moreover, the rates of glottalization among these contexts do not show such a significant variability. /t/ followed by a pause is realized as a glottal stop in 48% of cases. When the following sound is a consonant, the tendency to glottalize decreases – however, the result differs only by 1%. On the other hand, when a vowel follows /t/, rates for glottalization drop to 37%. In sum, while a following pause and consonant show no dramatic difference, a vowel seems to favour glottalization the least.

The last part of this section will be dedicated to the effect of the semantic status of the target word. The comparison in Figure 14 presents the percentage of glottalized/non-glottalized items for both grammatical and lexical words. Grammatical words, with 47% glottalized, outglottalize the lexical words by 7%. Having regard to the quantity of the items in both categories, the difference is considered, statistically, a highly significant result*:* X^2 (1; n =2539) =13.3; p <0.001.

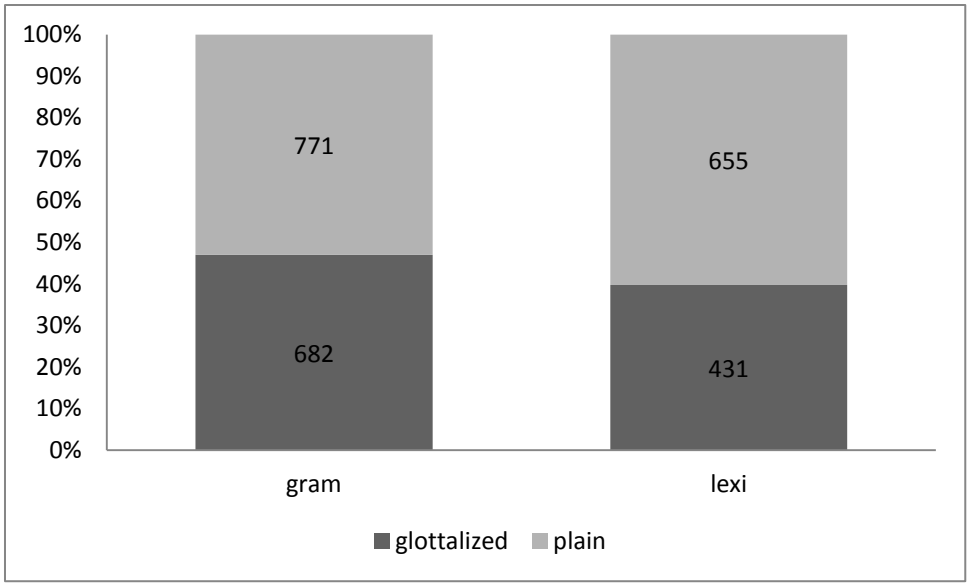

Figure 14: Percentage of glottalized items in grammatical and lexical words.

5. Discussion

In this study, we were interested in the relationship between the occurrence of glottalization and specific social factors, aiming to reveal what is the current nature of the social evaluation of the glottal stop in Britain. The starting point of our expectation was, therefore, based on a prevailing belief that the spread of the glottal stop in British English is associated with young middle class females (Milroy et al., 1994). The results of our study have proved this point to a considerable extent. We made no attempt to distinguish the social class of the speakers, which is considered a limitation of this study. However, sociolinguists agree that the definition of the social construct is problematic in itself and it was not manageable to control for the social background of our speakers. We primarily concentrated on gender and age instead. Let us now present what wider implications our findings offer.

Since highly significant gender differences emerged, we conclude that glottalization is not a stable feature; further, because women lead the use of the glottal stop, and all language changes are typically led by women, we assume it might be still in the process of a language change. In other words, it is still gaining sufficient prestige to become a standard form of British English pronunciation. If the change was completed, we expect it would result in stabilized results, with only insignificant differences between genders.

By dividing speakers into age groups, a discrepancy between young and old group distributions of the glottal stop was detected. According to our expectations, T-glottaling decreases as speakers get older. This observation perfectly corresponds with our hypothesis that older speakers are aware of the old stigmatization of the feature, and thus try to avoid it (34%). On the other hand, younger speakers with their 51% glottalized tokens prove to be linguistically innovative and seem not to take into account the social past of the phenomenon. This finding raises a further expectation that the frequency of T-glottaling is going to increase.

Considering gender and age aspects together, young females emerged as the strongest combination of factors, and thus confirmed the findings of other studies (see section Gender for concrete examples). An interesting competition of social factors can be observed between the groups of young males and old females. The former shows a slightly higher occurrence: 46% of glottalized items, while the latter T-glottalizes 41% of items. This order of results suggests that for T-glottaling, age is a stronger factor than gender.

The overall rates of glottalization show that the phenomenon is significantly spread. Examining the effect of speaking style, however, showed that speakers seem to avoid glottal

variants in more monitored, formal styles. While in the reading style, assumed to elicit more controlled, formal language variants, speakers glottalized only 30% of items, for spontaneous speech, the percentage is significantly higher: 47%. The increase is visible in all gender/age categories. On the basis of our sample and the type of analysis, we can hardly make bulletproof conclusions. However, a possible interpretation is that due to some persisting negative evaluation associated with the glottal stop, speakers seem to be self-conscious about using it and that is why T-glottaling appears to be subject to style-shifting in our speakers.

Further combining the gender, age and speaking style aspects, an interesting finding was revealed. While in reading style, old females show higher rates of glottalization than young men, which is suggestive that gender is a stronger factor, in spontaneous style the pattern is reversed, i.e. young males show slightly more glottalization than old women, suggesting a greater influence of age than gender. These conflicting results might imply the two factors are in a more complex competition than we concluded above. In any case, it opens up an interesting question for further investigation.

The next question was whether the prosodic position has any effect on the occurrence of a glottal stop. In terms of the phrasal position, phrase-final target words were glottalized more than phrase-internal words, although the difference is seen as statistically "only" significant, there is a space for some hypothetical interpretation of the result; it was suggested earlier that T-glottaling might function to signal phrase boundaries and this study corroborates the theory. Regarding the prosodic position within the word, the word-final context (before a pause) is a factor which significantly contributes to glottalization, and thus the boundary marking function seems to emerge as a possible explanation again.

From the prosodic point of view, the word-final /t/ of a phrase-final target word seems to be the most likely candidate for glottalization. This corresponds to the observation that English has a general tendency towards glottalization at domain ends (Redi & Shattuck-Hufnagel, 2001).

Furthermore, there is an alternative view of the results pertaining to word-position. Our finding corresponds with Fabricius' observation on the social distinction of target positions. Word-final context is considered well-established and part of RP (Fabricius, 2002), whereby the frequent occurrence of word-final glottalization may be clarified. In contrast, word-internal and pre-final contexts are divided between those that belong to RP and those that remain outside (and thus can be avoided), which explains why the rates of glottalization drop

here. The present study, therefore, confirms the existence of socially sensitive positions for T-glottaling.

Another point of interest was the most favourable preceding and following context. In the former category, a vowel clearly emerged as the segment which increases the probability of glottalization the most, which is in line with previous investigations (discussed in the "segmental context" section). There is a slight deviation from what was outlined in regard to the latter context. While the expected order was: pre-consonantal > pre-pausal > pre-vocalic, this study has arrived at a different conclusion: pre-pausal > pre-consonantal > pre-vocalic. The insignificant difference of only 1%, however, prevents us from doubting previous investigations.

The last point of discussion is the relationship between the semantic status of the word and the likelihood of glottalization. Our result suggests that grammatical words are more likely to be glottalized than lexical words. Although we supposed that they are often glottalized, despite of their low sentence stress (that is why we did not discard them from our analysis), they unexpectedly turned out to significantly outglottalize lexical words. This may be related to the fact that lexical words are "susceptible to reductive processes" (Phillips, 1983; cited in Schleef, 2013, p. 214), by which /t/ develops the glottal place of articulation.

6. Conclusion

The present study is a sociolinguistic examination of T-glottaling in British English. The primary aim was to analyze its relationship to gender, age and speaking style. The secondary focus included the influence of other sociolinguistic factors. More specifically, prosodic position, segmental context and semantic category of the target word were considered. The empirical research was based on 32 recordings of British speakers of English who provided both read and spontaneous speech data. In total, 2539 words were elicited for analysis.

The investigation was built upon three hypotheses which all operate with the fact that glottal stop is undergoing a language change. The first one claimed that females will glottalize more frequently than males because women are the initiators of the majority of linguistic changes. The second hypothesis argues that young speakers will outglottalize older speakers, since they are more linguistically innovative. The third hypothesis is concerned with the effect of speaking style: spontaneous conversation will yield more glottalization than reading tasks. The assumption was based on the belief that glottal stop, as a possibly still stigmatized form, might be avoided in a more formal speech style.

All the three hypotheses were confirmed, and thus many findings of previous research as well as sociolinguistic literature were proved. The rate of glottalization appears to be significantly dependent on all the three sociolinguistic factors. Speaking style, however, emerged to be the strongest influence. In terms of combinations of factors, glottalization is most likely to occur in the speech of young female speakers in spontaneous conversation.

A possible interpretation of the results may suggest that the glottal stop is still in the process of language change. Although the overall rates of glottalization (44%) imply the feature is frequent and widespread, it is still avoided by older speakers and in more formal contexts, implying negative social evaluation. Hypothetically, it means that it will take some more time of women's usage to establish the glottal stop as part of the standard pronunciation.

In terms of prosodic influence, glottalization showed only a very subtle tendency to occur in phrase-final position in comparison to phrase-internal position. A more statistically convincing finding was detected on the word level of prosody: word-final position makes the occurrence of T-glottaling more probable. Apart from that, segmental context also seems to play an important role as a preceding vowel and following pause present the ideal context for the glottal stop to appear. The investigation of the semantic status of the word showed that

grammatical (as opposed to lexical) words are more frequently glottalized, even in spite of the fact that they usually carry very little prominence.

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Shrnutí

Ve své bakalářské práci se věnuji výskytu substituční glotalizace v britské angličtině, a to zejména v závislosti na vybraných sociolingvistických faktorech. Zvláštní důraz je kladen na vliv pohlaví, věku a typu projevu. Okrajově jsou zkoumány i další lingvistické faktory, jako je segmentální a suprasegmentální kontext cílových pozic či vliv sémantického statusu slova (gramatické, lexikální) na výskyt glotalizace. Z popisu teoretické části vyplyne řada výzkumných otázek, na jejichž základě poté formulujeme hlavní hypotézy.

V rámci podání uceleného obrazu o tématu práce, měli bychom nejprve představit pojem glotalizace samotný. Z akustického hlediska patří glotalizace mezi jevy z kategorie tzv. nemodální fonace. Zatímco fonace modální je charakterizována neutrální pozicí hlasivek, umožňující jejich „normální“ kmitání a projevuje se v pravidelnosti zvukové vlny, frekvence i amplitudy, fonace nemodální představuje odchylku od této výchozí pozice a potažmo i běžného kmitání. Ať už se jedná o stav, kdy je hlasivková štěrbina otevřená příliš doširoka, nebo naopak téměř či plně uzavřená. Krajní pozice, kdy se hlasivky zavřou úplně, zabraňuje jejich kmitání a zvuk se přestává tvořit. Tak dochází ke vzniku tzv. hlasivkové explozívy (canonical glottal stop). Odchylky, typické pro nemodální fonaci, se manifestují ve vytváření nepravidelností ve zvukových vlnách.

Základní klasifikace glotalizace zahrnuje tři typy nemodální fonace: hlasivková explozíva, třepená fonace nebo také chrapot (creak) a dyšná fonace (breathy voice). Ač se od sebe pochopitelně v některých aspektech liší, percepční dojem, který vytvářejí, je téměř identický. Terminologicky jsou všechny tři realizace zastřešeny pojmem glotální ráz (glottal stop).

Ráz může vykonávat mnoho funkcí v různých jazycích světa. V některých může dokonce získat fonemický status, tzn. schopnost významově odlišovat jednotlivé jazykové jednotky. Pro naši práci je stěžejní alofonická funkce rázu, neboli substituční glotalizace. Tato funkce je typicky využívaná Angličtinou a dochází během ní k tomu, že ráz nahradí některou z neznělých plozív tj. /p,t,k/. Nicméně četnost distribuce rázu se u jednotlivých plozív liší. Jednoznačně nejčastěji se glotalizuje /t/, a proto také většina studií, včetně této, zužuje své zaměření pouze na něj. Z této skutečnosti také vyplynuly populární anglické termíny T-glottaling nebo T-glottalization.

T-glotalizace je jev fakultativní, pro jehož distribuci je charakteristická značná nevypočitatelnost. (Což na druhé straně podněcuje v této oblasti stále nové výzkumy.) Je nicméně známo, že je ovlivněn řadou lingvistických, geografických a sociálních faktorů.

Nejprve se ve stručnosti podíváme na vlivy lingvistické. Zde hraje dominantní roli především segmentální kontext cílové pozice. T-glotalizace se vyhýbá iniciálním pozicím. Objevuje se ve středních (word-medial) a koncových (word-final) pozicích v rámci slova, a to především po přízvučné slabice. Nejčastěji je předcházen vokály, případně dalšími sonorantami a následován je obvykle konsonantou nebo pauzou. Naopak následující vokál se z předchozích studií jeví jako nejméně příznivý kontext.

Vliv suprasegmentální úrovně na T-glotalizaci zatím nebyl dostatečně prozkoumán. Existuje však obecný poznatek, že T-glotalizace má jistou tendenci vyskytovat se na konci prozodických jednotek. Z čehož lze vyvozovat, že se ráz častěji objeví na konci fráze než v středních či iniciálních pozicích. Vzhledem k dosavadní neprobádanosti této oblasti, jsme se rozhodli v naší studii zaměřit i na vliv prozódie v rámci fráze.

Předtím než se budeme věnovat sociálním faktorům ovlivňujícím T-glotalizaci, bylo by užitečné představit obecné sociální aspekty tohoto jevu ve Velké Británii.

Ráz se dostal do povědomí široké veřejnosti především díky jeho sociálním implikacím. Původně bylo jeho užívání „výsadou“ londýnského Cockney, což je dialekt příslušníků dělnické třídy. To mělo za následek, že ráz začal být spojován s mužskou mluvou, a převážně se sociálně nízkými společenskými třídami. Podle toho byl také náležitě sociálně stigmatizován. V posledních přibližně dvaceti letech se situace nicméně výrazně změnila. Jak dokazují četné studie, T-glotalizace se rozšířila i do formálních stylů projevu a nalézt jej můžeme u mluvčích napříč všemi společenskými třídami. Sociolingvisté se tedy shodují, že ráz prochází nebo již prošel jazykovou změnou, během níž se z nestandardní formy stává standardní výslovnostní varianta britské angličtiny.

Na čem se studie zatím neshodují, je právě fáze jazykové změny. Přítomnost T-glotalizace v některých kontextech se již dávno stala součástí standardní britské výslovnosti (RP), což naznačuje, že změna je u konce. Na druhé straně k jiným kontextům (hlavně mezi vokály) je stále referováno jako k „sociálně citlivým“ (Altendorf & Watt, 2008, p. 210), což implikuje, že T-glotalizace s sebou stále nese jistou negativní sociální evaluaci a jazyková změna je tedy stále ve svém průběhu.

Pravděpodobně nejzajímavějším aspektem této jazykové změny je fakt, že je úzce spjata s vlivem pohlaví. Navzdory historické asociaci T-glotalizování s mužskou částí britské společnosti, šíření tohoto jevu je nyní výsadou žen. Tento model odpovídá obecnému principu

jazykových změn, podle něhož jsou ženy lingvisticky inovativní, a proto vedou většinu jazykových změn. Je to poté právě asociace s ženskou mluvou, která novou formu povyšuje na sociálně prestižnější. Ženy si tedy neosvojují prestižnější lingvistické formy, jak se původně předpokládalo, nýbrž si je samy vytvářejí, a tím se lingvisticky vymezují proti mužům. Ti jsou z lingvistického hlediska považováni za podstatně konzervativnější a formy, které používají, jsou častěji stigmatizované.

Je již zřejmé, že výskyt T-glotalizace je silně provázán sociálními faktory. Kromě pohlaví, hraje významnou roli společenská třída. Obecně platí, že čím níže se posouváme po společenském žebříčku, tím více stigmatizovaných a nestandardních lingvistických variant nacházíme. Zajímavé, je také chování tohoto sociálního konstruktu během jazykových změn. Labov přisuzuje důležitou roli střední společenské třídě. Ta je podle něj zodpovědná za šíření inovativních forem jazykovou komunitou.

Dalším důležitým faktorem, který má vliv na míru T-glotalizace, je věk. Podobně jako ženy, mladí mluvčí jsou považováni za lingvisticky inovativnější než starší mluvčí. Z toho také vychází jejich vedoucí role při jazykových změnách. T-glotalizace je spojována s mladými mluvčími, a to do takové míry, že mezi studiemi na toto téma bychom jen stěží hledali výsledek dokazující opak.

Je potřeba zdůraznit také vliv typu projevu na míru T-glotalizace. (Ten je spjat konceptem společenské třídy.) Mluvčí mají obecnou tendenci ke stylistické variabilitě. Ve formálnějších projevech obvykle používají lingvistické formy, které jsou spojované s vyššími společenskými třídami. Naproti tomu v neformálních či spontánních projevech se častěji uchylují k nestandardním formám.

Ani vliv dialektu není zanedbatelný faktor. V některých britských dialektech může být ráz zavedenou standardní formou, v jiných se objevuje teprve krátce a může být teprve v procesu jazykové změny. Ve Velké Británii se T-glotalizace hojně vyskytuje především v jižní Anglii, přičemž epicentrem je Londýn, který je považován za významný zdroj, nejen lingvistických inovací.

Experimentální část této práce zkoumá výskyt T-glotalizace v britské angličtině a to nejprve ve čteném, a poté ve spontánním mluveném projevu. Na základě teorií ze sociolingvistických literárních pramenů jsme pro naši studii postavili následující hypotézy:

H1: Ženy glotalizují ve vyšších mírách než muži.

H2: Mladší mluvčí glotalizují častěji než starší mluvčí.

H3: Ve spontánním volném projevu mluvčí glotalizují častěji než ve čteném projevu.

Metoda výzkumu spočívala ve v několika základních krocích. Nejprve jsme opatřili řečový materiál. Ten se skládal z nahrávek 32 mluvčích rozdělených podle pohlaví a věku na následující čtyři skupiny: mladé ženy, mladí muži, starší ženy a starší muži. Účastníci byli nejprve požádáni přečíst krátký text. Poté, v rámci sociologického rozhovoru, byl nahráván i jejich spontánní mluvený projev. Materiál byl následně zpracován ve fonetickém programu Praat, kde byly vyznačeny cílové hlásky. Na základě percepční analýzy bylo rozhodnuto, zda jsou realizované glotálním rázem. Pro zjištění statistické významnosti našich nálezů jsme se rozhodli podrobit konečné výsledky testu Chi-square.

Celkové množství nalezených cílových hlásek bylo 2539, z něhož 1113 bylo glotalizováno. 44% glotalizovaných /t/ tedy ukazuje, že T-glotalizace je relativně častým jevem. Výsledky potvrdily všechny naše hypotézy. Co se týká vlivu pohlaví na T-glotalizaci, ženy ukazují významně vyšší míru jejího používání, konkrétně 49%, oproti tomu muži, glotalizují pouze ve 39% případů. Tento rozdíl naznačuje, že T-glotalizace ještě není stabilní formou, a tudíž pravděpodobně stále prochází jazykovou změnou. Tato interpretace by také vysvětlovala, proč jsou to právě ženy, kdo formu, která je předmětem jazykové změny, šíří. Potvrzením druhé hypotézy se prokázalo, že míra T-glotalizace se s věkem snižuje. Skupina mladých mluvčích glotalizovala v 51% procentech případů, a tím utvrdila svou dominantní roli v šíření nových jazykových forem. Lze tedy předpokládat, že se jev bude v následujících letech dále rozšiřovat. Skupina starších mluvčích, se svými 34% glotalizovaných položek, se ukázala jako výrazně konzervativnější.

Dle našeho očekávání se ukázalo, že míry T-glotalizace se liší v závislosti na typu projevu. Zatímco ve spontánním projevu, mluvčí glotalizovali 47% položek, ve čteném, tedy formálnějším, projevu, bylo glotalizováno pouze 30% případů. Tento rozdíl naznačuje, že mluvčí se ve formálních kontextech T-glotalizaci vyhýbají. Za nejpravděpodobnější vysvětlení pokládáme, že tato forma je do nějaké míry stále pokládána za nestandardní či dokonce sociálně stigmatizovanou.

Z výzkumu vyplynulo, že model: „mladá žena hovořící spontánně“ tvoří celkově nejsilnější kombinaci faktorů pro T-glotalizování.

Další výzkum by bylo vhodné doplnit o analýzu vlivu společenské třídy. Zvážení tohoto faktoru by jistě obohatilo naše poznatky, nicméně kontrolovat sociální zázemí mluvčích se v tomto výzkumu ukázalo jako nerealizovatelné.

Pozorování vlivu lingvistických faktorů na míru T-glotalizace také potvrdilo řadu poznatků z dřívějších studií. Podařilo se například prokázat, že T-glotalizace má tendenci objevovat se na konci prosodických celků. Z různých prosodických kombinací, se zdá nejvhodnějším kandidátem pro T-glotalizaci /t/ v koncové slovní pozici, a to na konci intonační fráze. Výsledky studie také potvrzují existenci sociálně citlivých kontextů pro T-glotalizaci. Lehce překvapivý výsledek ukazuje porovnání četnosti glotalizace v lexikálních a gramatických slovech. Lexikální slova jsou ve větě prominentní, proto bychom u nich očekávali vyšší míru glotalizace než u slov gramatických, která jakoukoliv větnou prominenci často postrádají. Skutečnost, že se naše očekávání nenaplnilo, lze připisovat tendenci gramatických slov podléhat reduktivním lingvistickým procesům.